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# GUIDING EXERCISES IN GEOGRAPHY

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BOOK II  
THE BRITISH EMPIRE



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## I. CANADA

1. Draw a map of North America. Put in the boundaries of Canada and shade the dominion. Name: Dominion of Canada, Newfoundland, Labrador, United States, Alaska.
2. Describe the boundary between Canada and the United States from west to east. Say exactly where it runs, where it is a natural boundary, and where it is artificial.
3. Describe the boundary between Canada and Alaska.
4. Measure on the globe the shortest distance between England and Canada.
5. Use thin string to measure on the globe the distance from Liverpool to Halifax (Nova Scotia).
6. Which point of Canada is farthest south (give the latitude)? Which point on the mainland is farthest north? Over how many degrees of latitude does the mainland of Canada extend?
7. Find cities in Europe in about the same latitudes as Quebec, Toronto, Edmonton, Vancouver, Prince Rupert.
8. Which points on the mainland of Canada are farthest east and farthest west? Over how many degrees of longitude does the mainland of Canada extend?
9. The length of a degree of longitude at  $50^{\circ}$  latitude is  $44\frac{1}{2}$  miles. Find the width of Canada along the  $50^{\circ}$  parallel.
10. Draw a map of Canada and put in the following meridians:  $60^{\circ}$ ,  $75^{\circ}$ ,  $90^{\circ}$ ,  $105^{\circ}$ ,  $120^{\circ}$ . Put dotted lines midway between the meridians. Shade the spaces between the dotted lines in various ways and name them from east to west: Atlantic time (4 hrs. slow on Greenwich), Eastern time (5 hrs. slow on Greenwich), Central time (6 hrs. slow on Greenwich), Mountain time (7 hrs. slow on Greenwich), Pacific time (8 hrs. slow on Greenwich; this is the time for British Columbia), Yukon (9 hrs. slow on Greenwich).
11. Draw a map of northern Canada. Show in it the largest islands: Baffin Island, Ellesmere Island, Victoria Island. Name also: Mackenzie Bay, Baffin Bay, Davis



Strait, Fox Channel, Hudson Strait, Hudson Bay, James Bay, Ungava Bay, Cape Chudley.

Note that the Arctic coast is ice-bound.

12. In a map of the Gulf of St. Lawrence name: Newfoundland, Anticosti, Prince Edward Island, Cape Breton Island, Nova Scotia, St. Pierre (French); Strait of Belle Isle, Cabot Strait (both used by shipping); Cape Bauld, Cape Race, Cape Ray, North Cape; Quebec.

13. Draw a map of the west coast of Canada, naming: Vancouver Island, Queen Charlotte Islands; Queen Charlotte Sound; Juan de Fuca Strait.

14. Draw a map of Canada. Put in the 1,200 feet and 3,000 feet contours. Name the following surface features: Valley of St. Lawrence (rift valley in plateau), Laurentian Plateau (about 2,000,000 square miles of rugged country), Western Plains (from Winnipeg to Rocky Mountains, without break north and south), Prairies (part of Western Plains); Rocky Mountains; Coastal Ranges. The Atlantic coast region is separated from the St. Lawrence valley by a spur of the Appalachians.

15. Draw a map of Canada with the 1,200 feet contour. Put in the following rivers: St. Lawrence, Saskatchewan, Red River, Assiniboine, Nelson River, Mackenzie, Yukon, Fraser River, Columbia.

Draw thick lines separating the following systems of rivers: those which flow to the Pacific Ocean; those which flow to the Arctic; those which flow to Hudson Bay; the St. Lawrence; rivers flowing to the Atlantic.

16. Draw a map of the Mackenzie River. Put in the 1,200 feet contour, and name the lakes.

Note the position of these lakes in the foothills of the Rockies. The Mackenzie flows to an ice-bound ocean; it is used for canoe navigation, chiefly by trappers.

17. Draw a map of the St. Lawrence and the Great Lakes. Show the boundary of Canada going across Lakes Superior, Huron, Erie, Ontario. Name the lakes and shade the peninsula between Lake Huron and Lake Erie. This is a great fruit region.

Note that the St. Lawrence flows through a rift valley (where part of the plateau has sunk).

18. Draw a map showing the lakes of the plain—Winnipeg, Winnipegosis, Lake of the Woods. Name the chief rivers flowing into them and out of them.

19. Draw a map of the Laurentian Plateau. Show some of the numerous rivers flowing from this. These rivers are a great source of water-power.

20. Write an essay on Canadian rivers, using the following and any other suitable information: Canada quickly penetrated because canoes can go anywhere in the country; St. Lawrence, a great highway, free from floods because of the lakes; Fraser River famous for salmon; rivers can supply enormous water-power.

21. Draw a section across Canada from the north of Vancouver Island to Halifax (Nova Scotia). Name the various surface features on the map.

22. Draw two maps of Canada. Show by arrows the following winds:

- i. Summer—west winds in British Columbia; south-west in the centre and east; show also winds from north in the north.
- ii. Winter—south-west in British Columbia, north-west in the centre and east.

23. Show the following rainfall areas in a map of Canada:  
Over 60 in.—coast region of British Columbia; 40 in. to 60 in.—Rocky Mountain region of British Columbia; part east of St. Lawrence, including Newfoundland; 20 in. to 40 in.—east of the  $100^{\circ}$  W. meridian (except parts otherwise marked); 10 in. to 20 in.—west of  $100^{\circ}$  W. meridian; under 10 in.—north of a line across middle of Alaska (east and west), middle of Hudson Bay and Labrador.

24. Draw a rough section of the Rocky Mountains.

- i. Show by arrows a wind ascending the mountains from the west. Label this wind—'warm and moist'.
- ii. Make the arrows open out at the summit to show the expansion of the air. Label—'Air expands and cools; moisture falls as snow and rain; heat lost by vapour changing to snow and less by fall of temperature'.
- iii. Show the arrows descending the slope on the east and coming together, to show air being condensed. Label—

'Air condensed and warmed; warm dry wind; Chinook wind'.

This diagram explains the cause of the Chinook wind. (Note that if the wind were dry originally heat would be lost at the summit by fall of temperature only, and therefore the fall of temperature would be greater.)

25. Show the following summer isotherms in a map of Canada:

- i.  $64^{\circ}$ —from Vancouver to Edmonton in an upward curve, half circle north, across middle of Lake Winnipeg, to middle of north shore of Lake Superior, eastward across isthmus of New Brunswick and isthmus of Nova Scotia.
- ii.  $56^{\circ}$ —from near mouth of Mackenzie River, across Great Bear Lake, round Hudson Bay on west and across mouth of James Bay, across Anticosti and south-western end of Newfoundland. A branch of this isotherm runs along the west coast and across the middle of Vancouver Island.

26. Show the following winter isotherms in the same map as for Exercise 25 (dot the winter isotherms):

- i.  $16^{\circ}$ —from the southern point of the boundary of Alaska and British Columbia, south through the middle of British Columbia, south-east into the United States, a little north of east to the eastern end of Lake Superior, in a slight southern curve to the west of Prince Edward Island, north-east across the northern peninsula of Newfoundland.
- ii.  $0^{\circ}$ —roughly parallel with the last through the north of Lake Superior, opening out in the east and closing in in the west.
- iii.  $-16^{\circ}$ —roughly parallel to the last through the mouth of Nelson River.

27. Show the range of temperature between summer and winter at the following places in Canada: Halifax, Montreal, Winnipeg, Edmonton, Vancouver.

Note that the greatest range (continental climate) is found in the dry interior. It is much more endurable than if it occurred in a damp climate.

28. Draw a map of Canada. Draw a line from the extreme north-west, parallel to the Mackenzie and a little to the west and then the south of it, to Great Slave Lake; continue

to the east of Lake Athabasca, and then south-east round the east of Lake Winnipeg to the border. Continue the line nearly to the eastern end of Lake Superior, then east and rather north to Quebec. Draw a second, irregular, line from a little north of Great Bear Lake to Cape Churchill (on Hudson Bay); continue eastward across the north of the province of Quebec along Little Whale River, curve south along the Hamilton River.

Shade the space between these lines and write on it 'Pine forests'. Name the places mentioned.

29. On the same map as for the last exercise draw a line from the southern end of Georgian Bay, Lake Huron, to Quebec. Curve the line round to avoid most of the Ottawa Basin. Shade the region between this line and the pine forests, and mark it: Mixed forest. Show similar forests in the interior of Nova Scotia and New Brunswick.

Continue the first pine forest line southward from the Mackenzie River, along the Rockies to the Border. Continue the line north to Edmonton, then east to Prince Albert, and south-east to where the Red River crosses the border. Shade the space between this line and the pine forest, and mark it: Mixed forest.

Mark the region between the western mixed forest and the United States boundary: Prairies.

Mark the regions between the eastern mixed forests and the boundary: Cleared areas.

30. Draw a map of British Columbia and show the boundary. Divide the province into three equal strips by north and south lines and also by east and west lines. Shade the middle southern strip and mark it: Mixed forest. Shade the eastern southern strip and mark it: Evergreen forest. Shade Vancouver in the same way. Of the middle strips shade the middle and eastern. Mark this region: Pine forest. These lines indicate roughly the forest zones of British Columbia. There is also evergreen forest north-west of the pine forest.

31. Draw a map of Canada showing the chief natural resources: Nova Scotia—farming; New Brunswick—timber; basin of St. Lawrence below Toronto—farming; peninsula between Lakes Huron and Erie—fruit; north of Quebec—furs; Ontario and Quebec—timber and wood-pulp; prairie

region—wheat and mixed farming; northern Manitoba—mining; southern Saskatchewan and Alberta—cattle; northern Saskatchewan and Alberta, and North-West Territories—furs; south-east British Columbia—fruit; central British Columbia (north and south)—timber, mining, salmon fishing; Vancouver—timber; Yukon—mining.

32. Draw a map of Canada showing the chief minerals: British Columbia—coal, copper, lead, gold, silver, zinc; Yukon—gold, silver, lead; Alberta (west)—coal, natural gas; Ontario—gold, nickel, silver, copper, cobalt, natural gas; Quebec—asbestos, cement; New Brunswick—coal; Nova Scotia—coal, gypsum.

33. Find from an encyclopaedia the uses of: Nickel, cobalt, asbestos.

34. Note that Canada produces 90 per cent. of the world's nickel, 85 per cent. of the world's asbestos, and 55 per cent. of the world's cobalt.

Show these percentages in a diagram. (Represent the world production in each case by a long, narrow oblong.)

35. Write an essay on wheat farming in Canada, using the following and any other suitable information: About two-fifths of the area under field crops is wheat; since 1900 wheat lands have increased from  $4\frac{1}{4}$  million acres to nearly 25 million acres; the production has increased from 55 million bushels to over 500 million bushels; chief wheat lands in prairie region; Manitoba, Saskatchewan, and Alberta produce nine-tenths of Canadian wheat; machinery used largely for ploughing, reaping, and threshing; wheat stored in elevators; wheat 'pools' arranged for selling wheat; export via Fort William and Port Arthur, thence by Great Lakes to Canadian ports and New York; export also by rail to Montreal and to Vancouver; large-scale milling carried on in Ontario and Quebec.

36. Give an account of ranching in Canada, using the following and any other suitable information: Alberta the chief ranching province, with dry climate (much ranching land has been irrigated and used for wheat and mixed farming); cattle and horses live in the open all the winter, grass turns to hay where it stands; ranching extends to foot-

hills of Rockies, much open unoccupied country; Chinook wind keeps prairies free from snow in winter; considerable ranching also in Saskatchewan; dairying has been added to beef production.

37. Draw a map of the lumbering regions of Canada (see Exercise 28). Put in it the following information: About a quarter of the Dominion is under forests—80 per cent. pines; chief timber area is British Columbia, trees of great size in damp area; basin of St. Lawrence—timber and wood-pulp; Ottawa valley and Georgian Bay are chief lumbering centres; trees cut and floated down to sawmills, or carried on narrow-gauge railways; over 3,000 sawmills; wood-pulp and paper now a great industry; trees used not large enough or suitable for timber; greatest production of paper pulp in Quebec, followed by Ontario.

38. Write an essay on lumbering in Canada, using the information given in the last exercise.

39. Draw a map showing the fisheries of Canada. Put in it the following:

- i. Atlantic coast 5,000 miles—lobsters, cod, halibut, haddock, herring, sardines (young herrings used for these).
- ii. St. Lawrence and Great Lakes—whitefish, trout, lake herrings.
- iii. British Columbia—salmon of various kinds (not the true salmon), of which the sockeye is the most important; caught in Fraser, Skeena, and Naas; salmon canned on the spot, and exported in immense quantities.

40. Describe how canned salmon reaches your table, beginning with the salmon in the Skeena River.

41. Draw a map of Canada. Show the following provinces and their capitals: Nova Scotia (Halifax), New Brunswick (Fredericton), Prince Edward Island (Charlottetown), Quebec (Quebec), Ontario (Toronto), Manitoba (Winnipeg), Saskatchewan (Regina), Alberta (Edmonton), British Columbia (Victoria), Yukon (Dawson City), North-West Territories.

42. Draw a map of the St. Lawrence. Put in and name the following: The St. Lawrence, and Great Lakes, Ottawa River; Georgian Bay, Manitoulin Island, River St. Clair,

Niagara Falls; Port Arthur and Fort William (grain ports); Toronto (second city of the Dominion, university, distributing centre, foundries, meat packing); Ottawa (capital of Dominion, university, centre of lumber industry); Hamilton (centre of fruit region, manufacturing town); Kingston (locomotives and cars, tourist centre); Montreal (largest city of Canada, head of ocean navigation, railway centre, McGill University), Quebec (old and picturesque city, largely French, Quebec Bridge spans the St. Lawrence; 1759—city taken by Wolfe after battle on Plains of Abraham; exports lumber and wheat).

43. Draw a map of eastern Canada. Show the boundaries of the provinces. Put in and name: Halifax (chief winter port, naval station, exports fish and apples, university); St. John (winter port, machine shops, terminus of Canadian Pacific Railway); Fredericton (university, cathedral, railway centre); Charlottetown (port with fine harbour). Name also the Bay of Fundy (famous for its high tides and tidal bore); Reversible Falls (at St. John; these flow one way when the tide is out, and the other way when the tide is in); Northumberland Strait (between Prince Edward Island and the mainland).

44. Show the following in a map of central Canada. The chief lakes and rivers; boundaries of Manitoba, Saskatchewan, Alberta; Rocky Mountains; Winnipeg (gateway of the west, centre of wheat region, meat packing, university, grown to be a great city in about fifty years); Brandon (Government Experimental Farm); Regina (wheat centre and railway centre); Moose Jaw (stock yards, flour-mills); Edmonton (depot of fur traders, distributing centre, flour and saw-mills, meat packing); Calgary (centre for tourists to Rockies, flour and saw-mills, meat packing, natural gas used as fuel); Medicine Hat (farming centre, flour-mills, the 'Natural Gas City').

45. Draw a map of British Columbia. Show: Vancouver Island, Queen Charlotte Sound, Strait of Juan de Fuca, Queen Charlotte Islands; Rocky Mountains, Selkirk Range, Coast Ranges; Fraser River, Skeena, Naas, Columbia; Vancouver (port with fine harbour, head-quarters for lumbering, salmon canning, mining, university); Victoria

(capital, residential city, observatory); Esquimault (port close to Victoria); New Westminster (salmon canning); Prince Rupert (terminus of Grand Trunk Pacific section of Canadian National Railways).

46. Draw a map of Canada. Put in the St. Lawrence, Great Lakes, Ottawa River, Fraser River and Thompson River. Show the 1,200 feet contour. Put in the chief line of the Canadian Pacific Railway: From St. John to Montreal and Ottawa, along the south of the Ottawa River, along the north shore of Lake Huron to Fort William (on Lake Superior), north of Lake of the Woods to Winnipeg, through Brandon, Regina, Calgary, Banff, Kicking Horse Pass, down the Thompson River and the Fraser River to Vancouver. Put in a branch from Montreal, through Toronto, to Detroit (U.S.A.).

47. Show in a map similar to the last the following Canadian National (state-owned) Railways:

- i. The Grand Trunk Pacific section—Monckton (New Brunswick) to Quebec, then west to Winnipeg, to Edmonton, and to Prince Rupert (at the mouth of the Skeena).
- ii. Canadian Northern section—Montreal, Ottawa, Port Arthur, Winnipeg, Edmonton (keep to north of Grand Trunk Pacific), to Rockies, and south along the Thompson River and Fraser River to Vancouver.
- iii. A line from midway between Winnipeg and Edmonton to Port Nelson (Hudson Bay; this is a summer port).

Name the chief towns where Canadian railways connect with those of the United States—Montreal (New York and Chicago), Windsor (Detroit), Winnipeg, Vancouver.

48. Write an essay on the Canadian railways. Note the following—36 transcontinental trains are running at any time during the summer; the 'Trans-Canada Limited' does the journey from Montreal to Vancouver in 90 hours (2,885 miles). The total mileage is over 40,000 miles.

49. Draw a map of the St. Lawrence basin and show the following canals, with the information given:

- i. Sault Sainte Marie Canal (on St. Mary's River; about  $1\frac{1}{2}$  miles long, 150 feet wide, one lock; made to avoid fall in river).



- ii. Welland Canal (to avoid Niagara Falls; nearly 27 miles long; 26 locks).
  - iii. Lachine Canal (to avoid Lachine Rapids, above Montreal).
  - iv. Rideau Canal (Ottawa to Kingston).
  - v. Trent Valley Canal (Georgian Bay and Lake Ontario).
50. Draw a diagram illustrating the chief exports of Canada (the values are given in millions of pounds): Wheat and flour (87), paper and wood-pulp (32), timber (14), meats ( $7\frac{1}{2}$ ), fish ( $7\frac{1}{2}$ ), motors (7), cheese ( $6\frac{1}{2}$ ), gold (5), oats (5), barley (5), sugar (4), cattle ( $3\frac{1}{2}$ ), furs ( $3\frac{1}{2}$ ).
51. Which Canadian products can you find at the grocer's?
52. Draw a diagram showing the growth of wheat production in Canada (quantities in millions of bushels): 1871—16 $\frac{3}{4}$  (85 per cent. in Ontario); 1900—56; 1905—100; 1910—132; 1915—393; 1923—474; 1926—410 (only 5 per cent. in Ontario; over 50 per cent. from Saskatchewan); 1928—over 500.
53. Draw a diagram showing the growth of the manufactures of Canada: 1870—£45,000,000; 1880—£62,000,000; 1890—£94,000,000; 1900—£96,000,000; 1910—£235,000,000; 1925—£600,000,000.
54. Draw a map illustrating the new Canadian Pacific Railway route: Liverpool to Rimouski by steamer, Rimouski to Quebec or Montreal by aeroplane, thence by rail.

## II. NEWFOUNDLAND

- 1. Draw a map of North America showing the position of Newfoundland and the coast of Labrador which is under the Newfoundland Government.
- 2. Show the following coast features in a map of Newfoundland: Strait of Belle Isle, Cape Bauld, White Bay, Cape Race, St. Pierre and Miquelon (French). Show the Great Bank to the east and south of the island.
- 3. On a map of Newfoundland show the lakes and rivers. Note that about a third of the island is covered with water.

Name St. John (the capital and only large town, fish-curing and cod-liver oil).

4. Write an essay on the industries and trade of Newfoundland, using the following and any other suitable information: chief industry—cod fishing; dry cod and cod-liver oil are exported; also sealskins and seal oil; paper pulp is made and exported; copper ore is exported. The banks of Newfoundland are fished by ships from the United States and Europe as well as by those of Newfoundland and Canada. Valuable fishing grounds are also found off the coast of Labrador, and seals are found on the coast. Whale fishing is carried on in northern waters by whalers from Newfoundland.

### III. WEST INDIES, BRITISH HONDURAS, AND BRITISH GUIANA

1. Draw a map showing the Gulf of Mexico and the Caribbean Sea. Show the West Indies. Name: Florida, Yucatan, Panama; Greater Antilles, Lesser Antilles; Bahamas, Leeward Islands, Windward Islands; Cuba (with Havana), Haiti, Porto Rico, Jamaica, Trinidad.

2. Make a list of West Indian islands which are British. Arrange them in groups.

3. Draw a map of the West Indies and show the following divisions: i. Greater Antilles (mountainous). ii. Lesser Antilles (volcanic islands with several active volcanoes). iii. The Bahamas (flat coral islands fringed with coral reefs).

4. Write an essay on the climate of the West Indies. Use the following and any other suitable information: Almost entirely within the tropics; heat tempered by sea breezes and trade winds; dry season, December to May; wet season, May to December; hurricanes (cyclones) common in August and September, these do much damage.

5. Draw a map of Jamaica and put in the following: Blue Mountains (beautiful scenery); Black River (there are numerous rivers, but this is the only navigable one); Kingston (capital, chief commercial town); Spanish Town (old capital); exports—bananas, coffee (Blue Mountains), sugar (cane), rum, molasses, honey, ginger, pepper, and

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other spices; trade routes—Kingston to Liverpool through Windward Passage (between Cuba and Haiti), Kingston to Colon (Panama), Kingston to New York and Canada.

6. Draw a map of the West Indies. Name the British islands and the following productions: sugar—Barbados and Trinidad; arrowroot—St. Vincent; limejuice—Montserrat.

Note: All the islands produce tropical fruits, spices, &c.

Sponges—Bahamas; pitch—Trinidad (from a natural asphalt lake about  $1\frac{1}{2}$  miles round).

7. Draw a map showing the Bahamas. Name Watling Island. It was on this island, or Cat Island, that Columbus first landed in 1492. Twenty of the islands are inhabited. They are flat coral islands with reefs on the west. The chief productions are salt, sponges, and timber (mahogany). The capital is Nassau in New Providence Island.

8. Draw a map of North America and show the position of the Bermudas on the route from the West Indies to England. They are coral islands; they produce a fine variety of arrowroot; they are a winter resort on account of the mild climate. St. George has a fine harbour used as a naval station.

9. Draw a map of Central America showing British Honduras. Name the countries round it. Show the mountains (Cockscomb Mountains) in the interior. Name the port of Belize. Hilly regions are forest clad—mahogany, rosewood, india-rubber, logwood; sugar-cane and indigo are produced.

10. Draw a map of South America. Shade British Guiana and name the countries round it.

11. Draw a map of British Guiana. Show the position of the mountains (highest point 8,600 feet). Put in the Essequibo River and its tributary, the Potaro (on left bank about a third of length of river from mouth; on this river are the famous Kaieteur Falls, over 800 feet high); put in also the Courantyne River and Demerara River.

12. Show the following regions in a map of British Guiana:  
i. Coastlands—coast plain from ten miles wide on east to forty on west; steam pumps used for drainage; Georgetown

(capital and port, on the Demerara) and New Amsterdam are in this region. Georgetown is below the level of spring tides. The coast plains produce sugar, rum, molasses (the largest sugar estates are on the Demerara River), rice, and coco-nuts.

- ii. Belt of sand and clay, behind coast plains about fifty miles wide, slight hills clothed with high forests containing valuable timber trees (hard woods like ebony, greenheart, and mora; the balata is tapped for its gum).
- iii. Mountain region—forests, with savannahs in the south-west. Seven-eighths of the whole country is forest. Note that gold and diamonds are found along many of the rivers.

#### IV. AUSTRALIA

- 1. Measure on the globe (using string and the scale) the shortest distance from England to south-east Australia.
- 2. Measure on the globe the distance across Australia from east to west. Measure also the distance from Cape York to the most southerly point (Wilson's Promontory).
- 3. By how many degrees of longitude does eastern Australia differ from England? How many hours difference in time is there between the two?
- 4. A cricket match at Melbourne (south-east Australia) finishes at 6 p.m. on Tuesday. At what time can the first news be received in London?
- 5. Draw a map of Australia and show the following time regions: 10 hrs. fast on Greenwich—Victoria, New South Wales, Queensland, Tasmania, New Guinea;  $9\frac{1}{2}$  hrs. fast—South Australia, Northern Territory, west of New South Wales; 8 hrs. fast—Western Australia.
- 6. Across how many degrees of latitude does Australia extend?
- 7. Find the distances from the equator, in miles, of Cape York and Melbourne. (Multiply the number of degrees by  $69\cdot1$ , the length of a degree of latitude in miles.)
- 8. Describe the course of a voyage from England to Australia by each of the following routes: i. Via the Panama

Canal.<sup>4</sup> ii. Via the Suez Canal. iii. Via the Cape of Good Hope. iv. Via Cape Horn.

Give the ports of call on each route.

9. Show the following coast features in a map of Australia: York Peninsula, Eyre Peninsula; Tasmania, Flinders Island, Kangaroo Island, Great Barrier Reef; Cape York, Cape Howe, Wilson's Promontory, Cape Leeuwin, North-West Cape, Cape Londonderry, Cape Arnhem, Torres Strait, Gulf of Carpentaria, Hervey Bay, Bass Strait, Encounter Bay, Spencer Gulf, Great Australian Bight.

10. Draw a map of Queensland and the Great Barrier Reef. Name the Coral Sea. Note that the sea between the reef and the coast has been charted, and is used by large steamers. The reef is of coral.

11. Write an essay on the Great Barrier Reef. Use the following information, and any other information you can get: 1,200 miles long, 30 to 100 miles from shore; covers area of 30,000 sq. miles; broken by gaps near river mouths (corals cannot live in fresh water); 'sea cucumbers' are collected from reefs and exported to China for making soup.

12. Draw a map of Australia. Put in the following contours: 600 feet, 1,200 feet, 3,000 feet. Name: The plateau of Western Australia, Australian Alps, Blue Mountains, New England Range, Darling Downs, Mount Kosciuszko (7,540 feet), Mount Townsend (7,256 feet).

13. Draw a map of eastern Australia. Put in the 1,200 feet contour. Show the following rivers: Darling River, Murray, Murrumbidgee, Lachlan, Fitzroy, Burdekin. Note: The rivers to the east coast are well supplied with water. Inland streams are often long, they may be flooded in the wet season, but are merely successions of pools in the dry season.

14. Draw a map of Lake Eyre and its system of inland drainage.

15. Why should Lake Eyre be salt? Think of the water that the lake receives and the water it loses.

16. Leave a jar of tap water to boil away slowly. Add more tap water as it boils away. This will show how solid matter accumulates when water is only lost by evaporation.

17. Draw a map of the lakes of South Australia. Show also the coast ranges, and name them.

18. Draw a map of Australia. Put in the tropic of Capricorn and shade the part of the country which is in the tropics.

What fraction of Australia is in the tropics?

19. Draw a map of Australia and show the following summer isotherms:

i.  $88^{\circ}$ —two long ovals; one is from Cambridge Gulf to North-West Cape, some distance inland, and south as far as the Gascoyne River; the other is parallel with the south coast of the Gulf of Carpentaria and half-way across Queensland toward Brisbane; both ovals are wider toward the south.

ii.  $80^{\circ}$ —from mouth of Murchison River, in a smooth curve parallel with coast to Lake Torrens, then in a half circle (curving east) to Hervey Bay.

iii.  $72^{\circ}$ —from Perth, parallel to south coast in smooth curve.

20. Put in the same map as for Exercise 19 the following winter isotherms (dotted):

i.  $72^{\circ}$ —from King Sound to mouth of Roper River, and then to Cooktown.

ii.  $64^{\circ}$ —from North-West Cape, ENE. and then east to Halifax Bay.

iii.  $56^{\circ}$ —from Perth in quarter circle curving north to north of Lake Amadeus, then east to Mount King, and south to mouth of Clarence River.

iv.  $48^{\circ}$ —from Portland in three-quarter circle curving north to midway between Cape Howe and Wilson's Promontory, then to north-east point of Tasmania.

21. Draw a diagram showing the ranges of temperature at the following places: Sydney ( $71^{\circ}$ ,  $54^{\circ}$ ), Melbourne ( $67^{\circ}$ ,  $50^{\circ}$ ), Brisbane ( $77^{\circ}$ ,  $60^{\circ}$ ), Adelaide ( $73^{\circ}$ ,  $53^{\circ}$ ), Perth ( $73^{\circ}$ ,  $56^{\circ}$ ), Hobart ( $62^{\circ}$ ,  $47^{\circ}$ ), London ( $62^{\circ}$ ,  $39^{\circ}$ ).

22. Which are the hottest parts of Australia in summer? These are the regions of low atmospheric pressure.

23. Show the following winter isobars in a map of Australia:

i. 29.9 in.—across extreme north of Arnhem Land.

- ii. 30.6 in.—from midway between King Sound and the mouth of the De Gray River to mid-point of south coast of Gulf of Carpentaria, and then in same line across York Peninsula; this isobar runs far out to sea, curves round, and touches Wilson's Promontory.
  - iii. 30.1 in.—a long oval touching the west coast at Perth and crossing the east coast near the mouth of the Burdekin and near Mount Kosciusko; the oval is more than twice as wide at the eastern end as at the western end.
24. Show the following summer isobars in a map of Australia:
- i. 29.7 in.—from the Dampier Archipelago in a half-circle curving east to the mouth of the Roper River, then north along the coast of the Gulf of Carpentaria.
  - ii. 29.8 in.—from the mouth of the Murchison, east to Lake Eyre, then north-east to Halifax Bay.
  - iii. 29.9 in.—from Perth, east, and then ESE. to Melbourne.
25. Show by arrows the following winter winds in the map of winter isobars:
- i. Over the northern half SE. winds—these are monsoon winds, hot and dry.
  - ii. In south and west—WNW. winds.
  - iii. In south-east—SW. winds.
26. Show the following summer winds in the map of summer isobars:
- i. NW. monsoons in north.
  - ii. SE. trades on east coast and south generally.
  - iii. SW. winds toward south-west corner.
27. Draw a map of Australia showing summer rains:
- i. Over 40 in.—Arnhem Land, north of York Peninsula, east coast of Queensland. (Shade these regions heavily.)
  - ii. 30-40 in.—north of a line from south of Cape Londonderry, curving round to Rockhampton.
  - iii. 20-30 in.—north and east of line parallel with last and about the same width.
28. Draw a map of Australia showing winter rains:
- i. 20-30 in.—between Darling Range and west coast;

western half of Tasmania; east coast strip from Mount Kosciusko north to  $30^{\circ}$  S. Lat.

ii. 10–20 in.—from Rockhampton parallel with east coast to Murray River; then WNW. across Eyre Peninsula; west coast from Geraldton to west of Great Australian Bight.

29. Which other parts of the British Empire are in the same latitude as south-west Australia?

30. Draw a map of Australia showing the regions of vegetation:

i. Tropical forest—narrow coast strip from Roebuck Bay in west to Rockhampton in east.

ii. Savannahs—Draw a line from the mouth of the Fortescue River south to the Gascoyne, then to the source of the Murchison, north and north-east to the  $20^{\circ}$  S. parallel, a slight northward curve to where the tropic of Capricorn meets the  $140^{\circ}$  E. meridian, then east and a little south to near Mount Pluto, then NNW. to Cooktown. The region north of this line is savannahs.

iii. Sub-tropical (evergreen)—south-west of a line from the mouth of the Murchison to the western end of the Great Australian Bight. South of a line across the north of Eyre Peninsula, along the Murray to the Lachlan, then south-west to the coast. There is a third (inland) region in the south-east of Victoria.

iv. Forests and woodlands—the region in Queensland between the savannahs and tropical forest. This region continues south as a wide coast strip through New South Wales and Victoria, till it meets the evergreen region.

v. Grasslands—most of the interior east of the  $140^{\circ}$  E. meridian. An extension to Lake Eyre. A large triangle with the north shore of the Great Australian Bight as base.

vi. Semi-desert—interior and west between the other regions. There are large tracts of dry desert land in the centre, west of the  $140^{\circ}$  E. meridian.

31. Draw a diagram of an artesian well:

i. A saucer-shaped bed of clay.

ii. Over this a parallel bed of porous rock.

iii. Over this a parallel bed of clay.



iv. Over this other porous rock. Show wells sunk through to the lower porous rock. Water in this pours up through the well.

32. Show the following artesian basins in a map of Australia (water collects underground and may be tapped by means of artesian wells):

i. The Great Basin—draw a line from the south-east corner of the Gulf of Carpentaria, parallel with the east coast to the  $32^{\circ}$  S. parallel, then west, round Lake Eyre and back to the Gulf of Carpentaria (with an eastward curve), leaving a narrow neck on the gulf. Shade the area within this line.

ii. The Murray Basin—an area round the Lower Murray, on both sides of it, stretching half-way across Victoria.

iii. The Eucla Basin—a flat triangle with the shore of the Great Australian Bight as base. Eucla is at the middle of this basin which is the area of grassland.

iv. West Coast Basin—a coast strip from east of North-West Cape to Cape Leeuwin. This basin is twice as wide in the northern section as in the southern.

v. The Desert Basin—a rough oblong stretching from De Grey River to King Sound on the coast, and inland ESE. to near Lake Macdonald (north-west of Lake Amadeus).

33. Draw a map of Australia showing the chief regions in which sheep are reared: New South Wales, east of the mountains; Queensland, east of the mountains and south of  $22\frac{1}{2}^{\circ}$  S. Latitude; the south of South Australia including the Eyre Peninsula; the centre part of the Eucla Basin; Western Australia, south of the Murchison River and inland for about 250 miles; eastern Tasmania. Note on the map: Number of sheep about 80,000,000 (15 per cent. of total world flocks); about a quarter of Australian industry connected with sheep (chiefly wool); wool produced, over 600 million pounds in weight; about half the wool exported goes to Great Britain; there is an increasing trade in chilled lamb and mutton.

34. Draw a map of Australia showing the chief cattle rearing regions: A broad belt across central Queensland; this extends east into the coast strip east of the mountains, south

to Sydney; Victoria, except the north-west; this region extends north to Canberra on the east and misses the east coast; Western Tasmania. Note on the map: Total cattle over 14 millions; greatest number in Queensland; cattle rearing increasing in Northern Queensland, Northern Territory, and Kimberley district of Western Australia.

35. Draw a diagram illustrating the quantities of Australian dairy produce (quantities in millions of pounds): Butter—over 250; cheese—about 30; condensed milk and milk powder—about 70; export of eggs—about a million dozen.

36. Draw a map showing the chief wheat regions of Australia: In the east—a wide band west of the mountains, beginning in the latitude of Brisbane and extending south across New South Wales and Victoria. This band extends across the Yorke Peninsula and Eyre Peninsula (the latter being a less important region). In the west—a wide band east of the Darling Range. Note on the map: Wheat grown chiefly where rainfall is about 20 inches; total crop over 120 million bushels; sheep usually kept on wheat farms.

37. Draw a diagram showing the progress of wheat growing in Australia (quantities in millions of bushels): 1861—10; 1881—23; 1901—48; 1911—95; 1916—179; 1921—145; 1923—109; 1924—125. What was the cause of the sudden increase in 1916?

38. Show the chief fruit-growing regions in a map of Australia: Draw a line from north of Brisbane to Melbourne. Shade the region to the east of this line. Extend the shading to cover the whole of Victoria except the north-west corner. Shade also the district round Adelaide, the south-west corner (south of Perth), and Tasmania. Put the following information in the map: Vine grown chiefly in Victoria and South Australia (nearly £1,000,000 worth of raisins and half that value of currants are exported, as well as wine); chief fruits—apples, oranges, peaches, bananas, pears, plums, pineapples; write on Tasmania—apples, on Queensland—bananas, pineapples, and sugar-cane (east coast).

39. Draw a map of Australia showing the chief minerals: Coal—Newcastle district, extending south to Sydney and inland for about 50 miles; south-east Queensland. Gold—Coolgardie and Kalgoorlie (Western Australia), Bendigo,

Broken Hill, Mount Morgan; greatest production now in Western Australia. Silver, zinc, and lead—Broken Hill. Tin—north-west Tasmania. Copper and silver—Mount Morgan. Salt—Geelong, and salt lakes of South Australia and Western Australia.

40. Show the chief Australian railways in a map: The interstate line joining the five state capitals—Brisbane, to Newcastle and Sydney (inland and parallel to coast), to Bathurst and Melbourne, to Adelaide, to Port Augusta, to Kalgoorlie, and Perth; the whole journey takes eight days, the line runs for over 300 miles across Nullarbor (treeless) Plain without a curve; the projected north and south line—parts completed Darwin to Katherine, and Port Augusta to Oodnadatta (middle of north of South Australia); lines inland from the coast—Townsville to Cloncurry, Rockhampton to Longreach, Brisbane to Charleville, Sydney to Cobar, Petersburg to Broken Hill, Albany to York (east of Perth), Geraldton to Sandstone; show the projected line from Sydney to Camooweal (north-west Queensland); this line is completed to Bourke in north New South Wales; it will link up the inland ends of the east and west railways. Note that Victoria and New South Wales have an extensive network of railways.

41. Draw a map of Western Australia. Put in: The Swan River, Perth, Coolgardie, Kalgoorlie. Mark the region round Coolgardie and Kalgoorlie—'Gold Fields'. Name Mundaring Weir, about twenty miles east of Perth. Show by a thick line the great aqueduct from Mundaring to Coolgardie and Kalgoorlie. Measure on the map the length of the aqueduct.

42. The dimensions of the aqueduct from Mundaring to Kalgoorlie are: Length, 351 miles; width of pipe  $2\frac{1}{2}$  feet. The amount of water supplied daily at the eastern end is 8 million gallons. Find how long it takes water to travel through the pipes from Mundaring to Kalgoorlie.

43. Draw a map of Western Australia. Show in it the position of the great rabbit-proof fences: Starting half-way between Albany and Point Malcolm, north-west to near Merridin, then north to the latitude of Geraldton, then NNE. There is a second fence about half-way between this

and the coast, and a third running east from the coast in latitude about  $28^{\circ}$  S.

44. Name the following regions in a map of Western Australia: Gold fields round Kalgoorlie and in centre; north of  $18^{\circ}$  S.—tropical agriculture (cotton, coco-nuts, cattle); wide coast strip from  $18^{\circ}$  S. to  $28^{\circ}$  S.—irrigated tropical agriculture (cotton, dates); south-west (south of  $28^{\circ}$  S. and from 100 miles wide in north to 300 miles in south—agriculture and forests (wheat, dairy farming, fruit); inland regions—sheep. Note: Pearls (Shark Bay to Roebuck Bay); turtles (Roebuck Bay to King Sound).

45. Name the following towns in a map of Western Australia: Perth (capital, commercial centre); Fremantle (port for steamers from Europe and the East, six days' sail from Melbourne); Bunbury, Albany, Geraldton; Wyndham (in north-east; government meat works; export of chilled meat).

46. Draw a map of South Australia. Name the lakes and the peninsulas. Name: Adelaide (capital, silver and copper smelting); Port Adelaide; Port Pirie; Port Augusta (exports wool); Burra (noted copper mine). Show the chief railways: Adelaide to Melbourne and to Perth; Port Augusta to Oodnadatta; Port Pirie to Broken Hill. Note on the map the chief productions—wheat, wool, wine, fruit, dairy produce. There is a large irrigated area along the Murray.

47. Draw a map of Victoria and name the chief productions: Dairy produce (over the whole state); sheep (all state except north-west corner and south-east); wheat (northern half of state and west of mountains); fruit (southern half of state including all the eastern part); most of the Murray basin is now irrigated. Gold (Bendigo and Ballarat); coal and tin are also mined.

48. Name the following towns in a map of Victoria: Melbourne (capital, seaport, chief commercial centre, exports gold, wool, flour, chilled meat); Geelong (salt production, exports wool); Bendigo and Ballarat (gold mining); Mildura (centre of great irrigated fruit region).

49. Draw a map of Port Philip Bay, showing the positions of Melbourne and Geelong.

50. Draw a map of New South Wales. Name in it the

following productions: Dairy produce and fruit (east coast, including mountains); sheep (eastern half of state except narrow coast strip; the western half is a less developed sheep region); wheat (a wide strip west of mountains); fruit (a wide coast strip, including mountains, becoming wider toward the south); coal (Newcastle district—stretching fifty miles inland); silver and zinc (Broken Hill district). Copper and tin are also mined.

Name the Riverina, the region between the Murray and the Murrumbidgee.

51. Name the following towns in a map of New South Wales: Sydney (capital, greatest port of Australia with about the same tonnage as the Tyne Ports and Cardiff; Port Jackson has 165 miles of coast, the greatest harbour in the world); Newcastle (coal mining, coaling port for ships, iron and steel works); Broken Hill (great silver and zinc mines); Bourke (agricultural centre).

Put in also Canberra and the Federal Territory.

52. Draw a map of Queensland. Name in it the following productions: Shade a wide coast strip from Cape Grafton south, widening toward the south; mark this area 'Tropical Agriculture' (sugar, cotton, bananas, pineapples, maize). Note that this region extends a short way into New South Wales. Dairy farming (in the region of tropical agriculture); sheep (the central part of the state, as far north as the latitude of Townsville). Copper, gold, and silver (Mount Morgan); gold (Cloncurry and Charters Towers); coal (Ipswich, near Brisbane).

53. Name the following towns in a map of Queensland: Brisbane (capital, port and chief trading centre for the state); Rockhampton (port of central Queensland, meat-preserving works); Townsville (port of call, and port for north Queensland, exports tropical produce); Charters Towers (gold and silver, meat works); Cloncurry (gold and silver, centre of sheep and cattle region); Maryborough (port, tropical produce and butter); Gympie (gold); Toowoomba (centre of maize and wheat district); Mackay (port, exports sugar).

54. Draw a map of the Northern Territory and show in it: The coast strip of tropical forest, interior savannahs, and

the dry region (the southern half); Port Darwin and Port Essington; the railway from Port Darwin to Katherine, and the projected line to Oodnadatta and Adelaide. Note that the Northern Territory has not yet been developed. Sheep and cattle rearing are extending into the Territory from Queensland.

54. Draw a map of Tasmania showing: Dairy-farms and sheep (north-eastern half of island); fruit (all except the western coast strip); chief export, apples; tin in north-west; copper (Mount Lyell); forests in mountains, with dense undergrowth; Hobart (capital, port, fine harbour); Launceston (port, trades with Melbourne and Sydney).

Note—Tasmania has been called 'the playground of Australia'. Water-power is being developed from the numerous lakes and rivers. It is proposed to export power to Australia.

55. Draw a map of Australia showing the states and their capitals: Federal Territory (Canberra, capital of the Commonwealth), New South Wales (Sydney), Victoria (Melbourne), Queensland (Brisbane), South Australia (Adelaide), Western Australia (Perth), Tasmania (Hobart), Northern Territory (Darwin).

56. Draw a diagram showing the recent development of cotton growing in Australia (chiefly in Queensland): 1919—27,000 lb.; 1920—57,000 lb.; 1921—940,000 lb.; 1922—4,000,000 lb.; 1923—12,000,000 lb.; 1924—14,000,000 lb.

57. Draw a diagram illustrating the chief exports of Australia (values in millions of pounds): Wool (56); wheat and flour (20); hides (6); dairy produce, chiefly butter (6); chilled meats ( $5\frac{1}{2}$ ); fruit, fresh, dried and canned (3); lead (3); gold ( $2\frac{3}{4}$ ); silver, zinc, tin, copper (total  $4\frac{1}{2}$ ); coal ( $1\frac{1}{2}$ ); timber ( $1\frac{1}{2}$ ).

58. Draw a map showing northern Queensland and New Guinea (Papua). Shade the British part of it. Name: Torres Strait, The Owen Stanley Range, Musgrave Range, Gulf of Papua, New Britain, New Ireland, Bougainville, Admiralty Islands, Port Moresby.

Note the chief productions: Coco-nuts, rubber, cotton, sisal (fibre used for ropes), coffee. The country is covered with tropical forest.

59. Write an account of Australian forests, using the following information: Western Australia—forests of huge eucalyptus trees in south (jarrah used for sleepers); a belt of land 300 miles long and 20 miles wide; smaller eucalyptus trees flourish in the dry interior (Coolgardie), also sandal-wood (exported to China); Nullarbor Plain is entirely treeless. Victoria—forests in south and south-east, eucalyptus trees (red gum in Murray valley used for telegraph poles, paving blocks, and sleepers). Tasmania—once entirely wooded, now densely wooded in mountains, beech trees and black-wood (used for furniture). New South Wales—sub-tropical rain forests on coast (cedars, white beech, maple), and eucalyptus trees in drier regions inland. Queensland—tropical forests on coast with timber used for furniture, inland eucalyptus trees. Norfolk Island is famous for its pine trees used for masts and spars. Throughout Australia the forests give place inland to scrub (bushes and dwarf trees); ‘mallee’ is a very dense scrub of small eucalyptus trees occurring in South Australia and Victoria; it is being cleared to make way for field crops.

60. Write an account of Australian animals, using the following information: Marsupials carry their young in a pouch; kangaroo now found only in interior (there are many species, the largest being the ‘old man’ kangaroo); the opossum and native bear live in trees; the duckbill has a bill like that of a duck and a body like a mole’s, it is not a marsupial; the emu (the Australian ostrich) and cassowary are wingless birds; lyre-birds and bower birds build playgrounds for themselves; the black swan is a native of Western Australia.

61. Draw a diagram comparing the sizes of the Australian states: Queensland 670,000 sq. miles, New South Wales 310,000 sq. miles, Victoria 87,900 sq. miles, Tasmania 26,000 sq. miles, South Australia 380,000 sq. miles, Northern Territory 524,000 sq. miles, Western Australia 976,000 sq. miles, Federal Territory 940 sq. miles.

62. Draw a diagram comparing the populations of the states and their capitals (populations in thousands): Queensland 885, Brisbane 250; New South Wales 2,349, Sydney 1,070; Victoria 1,727, Melbourne 945; Tasmania

211, Hobart 55; South Australia 570, Adelaide 317; Northern Territory 4; Western Australia 384, Perth 178; Canberra 5. Each state capital has a university.

63. Find what percentage of the population of each state lives in the capital.

64. Draw a map of Australia showing the following air routes: Adelaide to Perth, Perth to Derby, Adelaide to Canberra (with a branch to Melbourne), Brisbane to Charleville, to Camooweal, and to Port Darwin.

## V. NEW ZEALAND

1. Measure on the globe the distance from England to New Zealand.

2. What is the difference in time between England and New Zealand?

3. Find from the map the direction in which New Zealand lies from southern Australia. What is the distance between the two countries?

4. Show the following features in a map of New Zealand: North Island, South Island, Stewart Island; Hauraki Gulf, Bay of Plenty, Hawke Bay, Cook Strait, Tasman Bay, Pegasus Bay, Banks Peninsula; Cape Maria van Diemen, East Cape, Cape Palliser, Cape Farewell, South Cape.

5. Compare the coast of North Island with that of South Island.

6. Show in a map of New Zealand the 1,200 feet and 3,000 feet contours. Name: Ruapehu (volcano, 9,175 ft.) and Mount Egmont (extinct volcano, 8,260 ft.), in North Island; in South Island—Southern Alps, Mount Cook (12,350 ft.), Mount Tasman (11,470 ft.), Mount Dampier (11,290 ft.); Canterbury Plains.

7. Draw a diagram comparing the heights of New Zealand mountains with Ben Nevis (4,406 ft.), Snowdon (3,560 ft.), Scafell (3,210 ft.), and Carrantual (3,414 ft.).

8. Draw a map of North Island with the 3,000 feet contour. Show in it: Lake Taupo and the Waikato River (area of lake 238 sq. miles, cliffs reach a height of 1,000 ft., Huka



Falls are near the outlet, volcanic peaks near it); shade lightly the region from south of Lake Taupo to the north of the island. This region is volcanic, with numerous hot springs, especially round Lake Rotorua (NNE. of Lake Taupo).

9. Draw a map of South Island with the 3,000 feet contour. Show in it: Lakes in the valleys of the Southern Alps (Te Anau, Wakatipu, Tekapo), these are glacier lakes, the valleys being dammed with moraine deposits; River Clutha (from Lake Wakatipu), Waitaki (from Lake Tekapo), Waiiau (from Lake Te Anau).

10. Draw a map of New Zealand. Show in it the following towns and beside each draw an upright line proportional to the rainfall: Napier (33 in.), Masterton (28 in.), New Plymouth (55 in.), Wellington (49 in.), Nelson (38 in.), Auckland (44 in.), Rotorua (54 in.), Christchurch (21 in.), Lincoln (26 in.), Hokitika (116 in.), Dunedin (37 in.), Queenstown (30 in.), Invercargill (47 in.).

11. Draw diagrams showing the average monthly rainfall at the following towns:

	<i>Auckland.</i>	<i>Napier.</i>	<i>Christchurch.</i>	<i>Dunedin.</i>
Jan.	2½ in.	2¾ in.	2 in.	3½ in.
Feb.	2½ in.	3 in.	2 in.	3 in.
Mar.	4 in.	3 in.	2 in.	3 in.
April	3½ in.	3 in.	2 in.	3 in.
May	4½ in.	3½ in.	2½ in.	3½ in.
June	5 in.	4 in.	2½ in.	3½ in.
July	5½ in.	3½ in.	3 in.	3 in.
Aug.	4½ in.	3 in.	2 in.	3 in.
Sept.	3½ in.	3½ in.	1¾ in.	2¾ in.
Oct.	3½ in.	3 in.	1½ in.	3 in.
Nov.	3 in.	2¾ in.	1½ in.	3½ in.
Dec.	3½ in.	2½ in.	2 in.	3½ in.

12. Show the following isotherms in a map of New Zealand: Summer, 64°—New Plymouth to south of Napier. The 56° summer isotherm just touches the south of New Zealand. Winter, 40°—Milford Sound, east to Waimate; 48°—Foxton to Cape Turnagain.

13. Draw a map of New Zealand and show the ranges of temperature at the following places (the summer and winter

temperatures are given after each): Auckland ( $67^{\circ}$ ,  $52^{\circ}$ ), Nelson ( $64^{\circ}$ ,  $46^{\circ}$ ), Napier ( $66^{\circ}$ ,  $49^{\circ}$ ), Christchurch ( $62^{\circ}$ ,  $43^{\circ}$ ), New Plymouth ( $65^{\circ}$ ,  $51\frac{1}{2}^{\circ}$ ), Hokitika ( $61^{\circ}$ ,  $45^{\circ}$ ), Wellington ( $63^{\circ}$ ,  $48^{\circ}$ ), Dunedin ( $57^{\circ}$ ,  $41\frac{1}{2}^{\circ}$ ).

14. Draw a diagram showing the average monthly temperatures at Napier: Jan.— $66^{\circ}$ , Feb.— $65^{\circ}$ , Mar.— $63^{\circ}$ , April— $59^{\circ}$ , May— $54^{\circ}$ , June— $50^{\circ}$ , July— $49^{\circ}$ , Aug.— $50^{\circ}$ , Sept.— $54^{\circ}$ , Oct.— $57^{\circ}$ , Nov.— $60^{\circ}$ , Dec.— $64^{\circ}$ .

15. Draw a map illustrating the history of New Zealand. Make the following entries:

i. West coast of South Island—discovered by Abel Jansen Tasman (Dutch) in 1642.

ii. Draw a dotted line showing Tasman's voyage from South Island to Cape Maria van Dieman.

iii. Poverty Bay (north of Hawke Bay)—discovered by Captain Cook in 1769.

iv. Draw a line showing Cook's voyage from Poverty Bay, round Stewart Island to Cape Farewell.

v. West coast (Facile Harbour)—first settlement in 1792, a sealing party which stayed for twelve months.

vi. Wellington founded in 1840.

vii. Bay of Islands (in north-east)—Captain Hobson proclaimed the sovereignty of Queen Victoria, with the consent of the natives. Capital at Auckland.

viii. 1852—representative government granted.

ix. 1907—New Zealand became 'The Dominion of New Zealand'.

16. Draw a map of North Island. Find Cape Runaway, the eastern point of the Bay of Plenty. Draw a line from Cape Runaway to a point midway between Wellington and New Plymouth. Shade heavily the land to the east of this line. This is the chief sheep grazing region in North Island.

Draw a line from Auckland to midway between Wellington and New Plymouth. Shade lightly the land to the west of this line. This is a less important sheep grazing region.

17. Draw a map of South Island. Draw a line from Blenheim to the middle of the south coast. Shade the land east

of this line. Shade also the region round Nelson. This is the sheep grazing region of South Island. Name the Plains of Canterbury.

18. Draw a map of North Island. Draw a line from East Cape to midway between Wellington and New Plymouth. Shade the land east of this line. Draw a second line from the mid-point to Tauranga (on the Bay of Plenty). Shade the land west of this line. Shade also the coast strip of the Bay of Plenty. These are the chief cattle regions of North Island.

Cross-hatch the regions round Cape Egmont and south of Auckland. These are the most important dairy regions.

19. Draw a map of South Island. Draw a line from Blenheim to Orikupi (on the south coast). Shade the land east of this. Shade also the west coast strip from Bruce Bay (half-way along the coast) to Nelson. These are the chief cattle regions of South Island. They do not produce so many cattle as North Island. Cross-hatch Banks Peninsula, the chief dairy region.

20. Draw a map of New Zealand. Draw circles round—Auckland, Napier, Nelson, Kaikoura. Draw a circle also in the middle of Otago (west of Dunedin). These are the chief regions in New Zealand which produce apples.

21. Draw a diagram illustrating the chief exports of New Zealand (the values are given in thousands of pounds): Wool (12,000), butter (9,000), chilled meat (9,000), cheese (5,000), skins and hides (2,000).

22. Draw a diagram illustrating the total New Zealand exports, and exports to the United Kingdom:

	<i>Total.</i>	<i>To United Kingdom.</i>
1903 . . .	£15,000,000	£11,350,000
1908 . . .	£16,300,000	£13,150,000
1913 . . .	£23,000,000	£18,130,000
1918 . . .	£28,500,000	£18,240,000
1926 . . .	£98,080,000	£57,850,000

23. Draw a diagram illustrating the increase in the export of chilled meat from New Zealand (in 1,000 cwt.): 1885—296; 1895—1,134; 1905—1,690; 1915—3,591; 1920—4,629; 1922—3,518.

24. Draw a diagram illustrating the export of butter from New Zealand (in 1,000 cwt.): 1903—285; 1906—320; 1909—321; 1912—378; 1915—420; 1918—431; 1921—898; 1922—1,120.

25. Draw a diagram comparing the chief sheep flocks of the world (the numbers are given in millions): Australia (82), Argentine Republic (45), United States (37), Union of South Africa (32), New Zealand (23), India (22), Great Britain (20), Spain (19), Russia (18), Italy (12), Uruguay (11½), Rumania (11), France (10).

26. Draw a map of New Zealand and show on the islands the numbers of domestic animals:

<i>North Island.</i>		<i>South Island.</i>	
Sheep	12,800,000	Sheep	10,300,000
Cattle	2,770,000	Cattle	710,000
Horses	177,000	Horses	136,000

27. Draw a map of New Zealand to show the forests. Draw a line from Cape Runaway to Wellington and shade a strip on each side of this line. Shade the peninsula on the east of Hauraki Bay and continue the shading south, round the Bay of Plenty. Shade also the coast strip from Hamilton to New Plymouth. Mark these regions 'rain forest'. These forests have the character of tropical forests (lianas or 'forest ropes', tree-ferns, filmy ferns, &c.).

In South Island shade the region west of the Southern Alps. Mark this 'beech forest'. Note that the beech forest is found at higher elevations and rain forest at lower, but in the south of South Island the beech forest descends to sea level.

28. In the forest map put in the 38° parallel of latitude. Write 'Kauri' on the region north of this line. The kauri is the largest timber tree of New Zealand. It also yields kauri gum.

Write 'totara' on the middle of North Island. This is the chief region for this valuable timber tree. Pines (red, white, black, and silver) are found, except in the beech forests.

29. New Zealand has been called the 'Britain of the South'.

i. Draw a diagram comparing the total areas of New Zealand and Great Britain: North Island 44,000 sq. miles, South Island 58,000 sq. miles, smaller islands 1,500 sq.

- miles; England 58,000 sq. miles, Scotland 30,000 sq. miles (including 4,000 sq. miles of islands).
- ii. Show on the diagram the range of latitude in each case and the total distance north and south.
  - iii. Draw a diagram showing the ranges of temperature at: Auckland, Wellington, Christchurch, Dunedin (see Exercise 14); London ( $62^{\circ}$ ,  $39^{\circ}$ ).
  - iv. Write a short note comparing the domestic animals of New Zealand and Great Britain.
30. Write an essay on the Maoris, using the following and any other suitable information: A fine and vigorous race; the only example of a native race living with a much greater white population, increasing in numbers (1901—43,000; 1911—50,000; 1921—53,000); four representatives sit in the New Zealand parliament (out of eighty); the Maoris were nomadic but have become settled on the land.
31. Draw a map of North Island. Show in it: Auckland (former capital, port with beautiful harbour, centre for tourists in the north, sawmills, furniture, engineering); Wellington (capital, trade centre, port with fine harbour, steam-ferry to Christchurch, manufactures similar to those of Auckland); Rotorua (Maori centre, hot spring district); Napier (the 'Brighton' of New Zealand).
32. Draw a map of South Island. Show: Christchurch (with its port Lyttelton, centre of great agricultural region, railway centre); Dunedin (port, centre for tours to the lakes); Invercargill (port with good harbour at the Bluff, centre for tours to western fiords); Hokitika (port, gold-mining region); Resolution Island (at south-west corner is a great bird sanctuary).
33. Draw a map showing New Zealand and the following outlying islands: Auckland Islands (mountainous islands, Port Ross is one of the best harbours of refuge in the world); Antipodes Islands (small islands).
- On these and other small islands the New Zealand Government maintains depots of provisions for castaways.
34. Find the position of the Cook Islands (latitude and longitude) and the distance from New Zealand. Show in a map the Cook Islands and other islands grouped with them

under the New Zealand government: Rorotonga (mountainous island, forests and rich valleys); Mangaia (volcanic); Niue or Savage Island (coral, coco-nuts); Palmerston Island ('San Pablo', the first island discovered by Magellan in the South Sea); Manthiki (an atoll 30 miles round, coco-nuts and pearl-shell); Penrhyn Island (famous for pearls); Suwarrow (a triangular atoll 50 miles round enclosing a lagoon 8 miles by 6 miles, visited periodically).

Note: Population of islands—13,000; exports—copra, oranges, bananas, tomatoes, and tropical fruits.

35. Find the position of Western Samoa (latitude and longitude, and distance from New Zealand). Note that the islands are held under mandate of the League of Nations. The chief export is copra; population is 37,000, of whom 2,000 are European.

Find also the position of Nauru. This is a small island with great deposits of phosphates, which are shared jointly by the United Kingdom, Australia, and New Zealand.

## VI. INDIA

1. Measure on the globe the distance from England to India.
2. Draw a sketch-map showing the chief places on the Suez Canal route from London to Bombay. Name: London, Southampton, Gibraltar, Marseilles, Malta, Port Said, Aden, Bombay. Show the overland route from London to Marseilles.
3. Draw a sketch-map showing the Cape route to India. Name Cape Town (the chief coaling station).
4. Draw a map of India and the Malay Peninsula. Show in it the following time zones: 7 hrs. fast on Greenwich—Malay States, Straits Settlements;  $6\frac{1}{2}$  hrs. fast—Burma, Andaman Islands, Nicobar Islands;  $5\frac{1}{2}$  hrs. fast—India (except Calcutta and Portuguese India), Ceylon, Laccadive Islands; 5 hrs. fast—Portuguese India.
- Calcutta has its own time—5 hrs. 53 min. 21 sec. fast on Greenwich.
5. Find how far the mainland of India stretches north and south in latitude. What is the difference in miles (1 degree of latitude—about 69.1 miles)?

6. Find the difference in longitude between Calcutta and Karachi.

7. Draw a map of India showing the islands. Put in the following information: Ceylon (capital Colombo); Andaman Islands (timber and coco-nuts, convict station, Port Blair on South Andamans), Nicobar Islands, Maldive Islands (low coral islands, atolls as much as ninety miles long from end to end, export fish and tortoiseshell, islands covered with coco-nut palms, under the Ceylon Government); Laccadives (low coral islands covered with coco-nut palms, the coral was anciently excavated and the rock below used for crops); Mergui Archipelago (Lower Burma, pearl fishing); Cutch (a sort of island cut off from the mainland by the Rann of Cutch, partly salt lake and partly morass; Cutch is generally barren); Bombay.

8. Show the following coast features in a map of India: Delta of Indus, Rann of Cutch, Gulf of Cutch, Cutch, Kathiawar Peninsula, Gulf of Cambay, Malabar Coast, Cape Comorin, Manar Gulf, Palk Strait, Adam's Bridge, Coromandel Coast (with numerous lagoons), Golkonda Coast, Ganges Delta, Pagoda Point, Irrawadi Delta, Gulf of Martaban.

9. Draw a map of India and show in it the chief mountains: Himalayas (along the edge of the Tibetan plateau; greatest height 29,000 ft.); Karakoram, Hindu Kush; Suliman Range; Khasi Hills; Patkoi Mountains; Lushali Hills; Arakan Yoma; Aravalli; Vindhya Mountains; Satpura Range; Western Ghats; Eastern Ghats; Nilgheris; Cardamon Hills. Put in also the Plateau of Tibet, and the Deccan.

10. Draw a diagram comparing the heights of the chief mountains of India: Himalayas—Mount Everest (29,002 ft.), Kanchinjunga (28,150 ft.), Makalu (27,790 ft.), Dhawalgiri (27,000 ft.); Karakoram—Mount Godwin Austin (28,260 ft.); Hindu Kush (20,000 ft.); Suliman Range (about 11,000 ft.); Khasi Hills (about 6,000 ft.); Patkoi Mountains (about 10,000 ft.); Lushali Hills (about 6,000 ft.); Arakan Yoma (up to 7,000 ft.); Aravalli (nearly 6,000 ft.); Vindhya Mountains (up to 4,000 ft.); Satpura Range (4,500 ft.); Western Ghats (up to 4,700 ft. near Bombay, up

to 8,900 ft. in south); Eastern Ghats (about 3,000 ft.); Nilgheris (about 8,600 ft.); Cardamon Hills (up to 4,000 ft.).

11. Draw a map of the north and west of India and show the chief passes out of India: Khyber Pass (3,400 ft., Peshawar to Kabul, near Kabul River), Gomal Pass (7,500 ft.), Bolan Pass (south of Quetta, 5,800 ft.), Karakoram Pass (18,100 ft., from Srinagar to Leh and Yarkand).

12. Draw a map of the Deccan. Show: The Vindhya Hills, Eastern Ghats, Western Ghats, Nilgheri Hills, the Godavari, Mahanadi, Kistna, Cauveri, Tapti, Nerbada. Note that the rivers on the east have deltas. The eastern rivers pierce the Eastern Ghats and descend rapidly to the sea.

13. Draw a map showing the chief plains of India. Show in it: The plains of the Ganges and Indus. This plain includes the Great Desert between the fertile river plains. Name the rivers and their tributaries.

14. Draw a map of the Ganges. Show: The Himalayas and the Vindhya Mountains; the Ganges and its tributaries; the delta (called the Sanderbans, from a small tree which grows there in great numbers). Name the Doab, the land between the Ganges and the Jumna; put in the Ganges and Jumna canals, which irrigate this region. Note that the Ganges is the chief highway for the internal commerce of India. The delta stretches inland for nearly 300 miles.

15. Draw a map of the Indus. Show: The Himalayas and Karakoram Mountains; the Indus and its tributaries. Name the Punjab, the country of the five rivers (Indus, Jhelum, Chenab, Ravee, Sutlej). Note that the Indus rises north of the Himalayas and crosses them through wild gorges. It crosses the desert of Sind and forms a wide delta. The port of Karachi is at its mouth. The Sutlej also pierces the Himalayas.

16. Draw a map of the Brahmaputra. Show the Himalayas and the mountains of Assam. Note that the river rises north of the Himalayas, and cuts through them in deep gorges. The mouth joins with the Ganges delta. In its early course the Brahmaputra is called the San-po.

17. Draw a map showing the rivers of the Deccan. Show the Western Ghats, the Eastern Ghats, the Satpura Range,



and the Vindhya Mountains. Put in: the Narbada, the Tapti, the Godavari, Mahanadi, Kistnah, Cauveri. Note that the streams flowing east have deltas. They cut through the Eastern Ghats by narrow gorges.

18. Show the following winter isotherms in a map of India:

- i.  $80^{\circ}$ —just touches Cape Comorin.
- ii.  $75^{\circ}$ —from Bombay east to the middle of the Deccan, then south-east, and east to Masulipatam.
- iii.  $70^{\circ}$ —east along  $22^{\circ}$  meridian with a slight southward dip at each end.
- iv.  $65^{\circ}$ —parallel with the last, through Karachi and head of the Ganges delta.
- v.  $60^{\circ}$ —from junction of Sutlej and Indus east to Ganges, then ESE. to Patna, and then east. North-west from Sutlej.
- vi.  $55^{\circ}$ —parallel with the last, through Lahore.

19. Show the following summer isotherms in a map of India.

- i.  $85^{\circ}$ —a long narrow oval from Madura (Palk Strait) to Masulipatam. The eastern side is on the coast.
- ii.  $80^{\circ}$ —from Cape Comorin, north to  $12\frac{1}{2}^{\circ}$  N. Lat., then north-west to the coast at  $20^{\circ}$  N. Lat.
- iii.  $85^{\circ}$ —from north of Karachi east to junction of Ganges and Jumna, then in a sharp curve to the north-west to the source of the Ganges.
- iv.  $90^{\circ}$ —from Hyderabad (Indus) in a half circle curving east to where the Indus crosses the Himalayas.

20. Draw a map of India. Show the following winter isobars:

- i. 29.9 in.—from the west coast,  $13\frac{1}{2}^{\circ}$  N. Lat., to the east coast,  $10^{\circ}$  N. Lat.
- ii. 30.0 in.—from Karachi, with a slight northward curve to  $80^{\circ}$  E. Long. then east to  $85^{\circ}$  E. Long., then north-east to Darjeeling, and then east.
- iii. 30.1 in.—from  $33^{\circ}$  N. Lat. on the Indus, north-west along the Indus to the bend, then ESE.

Show the direction of the winter monsoon: Draw arrows pointing from NE. to SW. (from the high pressure area).

This is the north-east monsoon which blows from October to February.

21. Draw a map of India. Show the following summer isobars:

- i. 29·8 in.—just touches Cape Comorin.
- ii. 29·7 in.—from south of Bombay, south-east to Madras.
- iii. 29·6 in.—parallel to last, through mouths of Tapti and Godavari.
- iv. 29·5 in.—from mouth of Indus, east with slight northerly curve to near Ganges delta, then curving to north-west.
- v. 29·4 in.—narrow oval, along Indus and Sutlej, from Shikarpur to Multan.

Show the direction of the summer monsoon. Draw arrows pointing from SW. to NE. This is the south-west monsoon which blows from the high pressure area over the sea, from June to October.

22. Draw a map of India. Show on it the winter rainfall:

- i. 20–30 in.—a long oval east of the Brahmaputra and parallel to it; a coast strip on the south-east; Ceylon (heavier rain in south-east).
- ii. 5–20 in.—Himalayas, Ganges delta, east coast, south to  $12^{\circ}$  N. Lat.
- iii. Under 5 in.—remainder of India.

23. Draw a map of India. Show in it the summer rainfall:

- i. Over 80 in.—eastern half of Himalayas, Assam, coast of Burma and Malay Peninsula, west coast south of Tapti.
- ii. 40–80 in.—draw a line from the mouth of the Godavari, north-west to the Narbada, north-east to the Jumna and along the Ganges to the junction with the Gogra, then north-west to enclose the Himalayas. Shade the country between this line and the heavy rainfall region. Shade also the Western Ghats and the south-west of Ceylon.
- iii. Under 10 in.—from north-east end of Rann of Cutch draw a line to the north, with a slight eastward curve. Shade the land to the west of this line. This is the region of very low summer rainfall.

24. Compare the maps showing winter winds and winter rainfall. Why is there little rainfall at this season?

Why is there heavy rainfall during the time of the south-west monsoon?

25. Why have the Western Ghats much heavier rain than the Eastern Ghats?

26. Draw a diagram explaining the heavy rainfall of Assam. Show the mountains in a map—Himalayas and Patkoi Mountains forming a funnel shape. Show also the Khasi Hills. Indicate by arrows the direction of the south-west monsoon entering the funnel and forced upward. The first 'squeeze' and heaviest rainfall is round Cherrapungi. Name this town, and write: Rainfall 500 in., heaviest in world.

27. Why should the west of India (north of Cutch) be dry? Find from a map where the south-west winds blow from.

28. Draw a map showing the dry regions of India and Burma: i. The Thar—north and west of the Aravalli Hills. ii. Desert of Sind—round lower Indus. iii. West of the Indus. iv. A small region round Mandalay (shaded by the Burmese Mountains). v. The Deccan—a strip east of the Western Ghats, toward the middle.

29. Show the following vegetation regions in India:

- i. Tropical forests—the regions of heavy rainfall—western coast strip (west of Western Ghats), south-west of Ceylon, Assam, Burma, extending south to Malay Peninsula.
- ii. Tropical grasslands—Deccan, basins of Ganges and Indus (except desert part).
- iii. Deserts of Thar and Sind.
- iv. Broad-leaved forests—lower Himalayas, Western Ghats.
- v. Pine forests—higher Himalayas.

30. Draw a diagram showing vegetation zones on the Himalayas: i. Lower slopes—tropical forest. (The Tarai is damp and covered with rank vegetation.) ii. Sub-tropical vegetation. iii. Region of deciduous trees. iv. Region of pines and firs. v. Alpine shrubs (especially rhododendrons) and rock plants. vi. Ice desert above the snowline (about 16,000 feet on the southern side).

31. Draw a diagram illustrating the climate of India:

- i. Hot Season—Feb. to May—scorching winds from hot deserts of the west.

- ii. Rainy season—June to October—south-west monsoon, with heavy rains in the first two months.
- iii. Cool season—October to February—north-east monsoon, cool and dry.

At the change from the south-west to north-east monsoon there are calms and hurricanes.

32. Draw a map of India showing the chief regions which produce rice: Lower Ganges and delta, lower half of Godavari basin, north-east of Deccan, plains of Burma. Name: Patna (on Ganges), and Rangoon (Burma). Rice is sold under these names. Note: Rice is grown to a lesser extent over most of India south of an east and west line through Patna.

33. Draw a map of the Ganges and Brahmaputra delta. Name the Sanderbans (the seaward end of the delta, named from the sanderbans, bushes which grow there in great numbers), Brahmaputra, Megua River, Hugli; name the chief productions—rice and jute (used for rope and sail-cloth); Calcutta (former capital of India, important port, emporium, jute factories); Murshedabad (at head of delta, ivory carving); Dacca (muslins).

34. Draw a map of India showing the regions which produce tea, coffee, and cocoa: Tea—Assam and region north of Ganges, southern part of Western Ghats (eastern slopes), Ceylon, lower basin of Irrawadi. Coffee—Ceylon, Western Ghats (southern part, eastern slopes), Burma (Mandalay). Cocoa—Ceylon.

35. Draw a map of India showing the regions which produce cotton: Deccan (indicate by arrows export from Bombay and Madras), east of Surat (port—Surat), Punjab (port—Karachi), Central India (port—Bombay). To a lesser extent cotton is grown over most of India.

36. Show in a map of India the following cereal productions: Wheat—Punjab and United Provinces, west of Deccan except south (this region stretches west to Karachi; name Karachi, the great grain port); maize—region north of Ganges, Burma, Punjab.

37. Show the regions which produce cane-sugar in a map of India: From Surat draw a line eastward to the Ganges

delta; draw a line north-east to Delhi, east and then south-east to the mouth of the Hugli. Shade the area within this region. Shade the district round Quetta. Shade also the districts round the mouth of the Kistna and round Calicut. These are the chief cane-sugar regions.

38. Show in a map of India the chief minerals: Gold—south-west Deccan, mouth of Godavari, middle Ganges basin; silver—south-east Deccan, basin of Narbada, west of Jumna at junction with Ganges; copper—Ganges basin; coal—westward of the Ganges delta, middle of Godavari basin, basin of Son (tributary of Ganges), Assam; petroleum—middle of Burma; iron—Eastern Ghats, Western Ghats, basin of Ganges; mica—head of Ganges delta, mouth of Godavari; rubies—middle of Burma; salt—Rann of Cutch.

39. Draw a map of the Ganges and show in it: The Himalayas, the Ganges and its tributaries; name the Doab and put in the irrigation canals. Name: Calcutta, Murshedabad, Patna (river port stretching nine miles along river, trade in rice, wheat, opium); Benares (religious capital, with many temples, visited by pilgrims, makes fancy goods); Allahabad (sacred city, trade in corn and cotton); Cawnpore (grain, noted for massacre in 1857); Lucknow (famous defence in 1857); Meerut; Saharanpur (trading centre); Agra (with the beautiful Taj Mahal); Delhi (capital, railway and trade centre, formerly capital of the Mogul Empire); Gwalior (capital of the native state of Gwalior, fortress); Katmandu (capital of Nepal).

40. Draw a map of the Indus and show in it: the Himalayas and mountains on the west; the Indus and its tributaries; the Thar. Name: Karachi (great wheat port, now an air port on the route from Croydon to Australia); Hyderabad (silks); Multan (silks, trading centre); Lahore (capital of Punjab, ancient walled city); Patiala (capital of state of Patiala); Amritsar (fortified city, shawls and silks); Peshawar (at foot of Khyber Pass); Srinagar (capital of Kashmir); Simla (health resort and summer residence of officials; height over 7,000 ft.).

41. Draw a map of the Deccan. Put in the mountains and rivers. Name: Hyderabad (capital of native state of Hyderabad, cottons, trade in wheat and oil); Bangalore

(woollens); Mysore (capital of province of Mysore, trade in grain and oil); Trichinopoli (cigars, jewellery, silks, cutlery); Nagpur (many Hindu temples, inlaid work); Poona (ivory, cotton, silk).

42. Draw a map showing the chief ports of India: Calcutta, Bombay (chief port of India, on route from Europe to China and Australia, many manufactures including cotton, founded by the enterprise of Parsees); New Goa (Punjim—the port of the Portuguese territory of Goa; the harbour of Goa is now silted up); Mangalore (exports pepper and coffee); Calicut (calico and coffee); Negapatam (rice); Madras (capital and port of Madras, muslins and rice); Masulipatam; Cuttack (head of Mahanadi delta); Chittagong (port for Assam, tea and rice); Rangoon (rice and teak). Put in also Colombo.

43. Draw a map showing the position of Bombay, on an island nine miles long. Indicate sea connexions with Aden, Karachi, Colombo, Madagascar. Show also the railways to the interior—i. The coast route north to Baroda and Agra. ii. Through the Western Ghats to Allahabad. iii. Through the Western Ghats to Poona, Hyderabad, and Madras.

44. Draw a diagram comparing the lengths of the stages in the journey from London to Bombay. The total distances from Bombay are: London 6,260 miles, Gibraltar 4,950 miles, Marseilles 4,550 miles, Port Said 3,050 miles, Aden 1,650 miles.

45. Draw a railway map of India. Show the following lines: i. Calcutta to Peshawar, through Patna, Benares, Allahabad, Cawnpore, Agra, Delhi, Lahore. ii. Calcutta to Darjeeling. iii. Calcutta to Madras, near the coast, through Cuttack. iv. Bombay to Allahabad, through Thal Ghat Pass, and Jabalpur. v. Bombay to Calcutta. This line branches off from the last south-west of Burhanpur; it goes through Nagpur. vi. Bombay to Madras, through Bor Ghat Pass, Poona, and Sholapur. vii. Goa to Bellary, joining Madras line east of Bellary. viii. Calicut to Madras, through Pal Ghat Pass. ix. Bombay to Delhi, through Baroda and Jaipur. x. Karachi to Hyderabad, Multan, and Lahore. xi. Karachi to Quetta, through Shikarpur and Bolan Pass.

xii. Through middle of Assam—Chittagong, north then north-east.

46. Draw a map showing the chief provinces and states of north-west India: Kashmir (capital Srinagar, native state); Punjab ('land of the Five Rivers', capital Lahore, province); North-West Frontier Province (British districts and tribal areas, the latter mountainous and barren); Baluchistan (British Baluchistan—capital Quetta, several native states); Sind (division of Bombay, capital Karachi); Rajputana (20 native states, including Jaipur, Jodhpur or Marwar, and Udaipur or Mewar); Patiala (capital Patiala).

47. Draw a map showing the chief provinces and states of central India: United Provinces of Agra and Oudh (capital Allahabad; richest wheat lands in India); Central India (153 native states, the chief are Gwalior, Indore, and Bhopal, with capitals of the same names); Central Provinces (capital Nagpur; includes Berar, leased from Nizam of Hyderabad).

48. Draw a map showing the chief provinces and states of southern India: Hyderabad (capital Hyderabad; chief native state); Bombay (presidency; includes Sind and Aden, capital Bombay); Mysore (capital Mysore; native state); Madras (presidency; capital Madras); Travancore (capital Trivandrum; native state); Cochin (native state).

49. Draw a map showing the chief states of western India: Bengal (capital Calcutta; presidency); Bihar and Orissa (capital Patna; province); Nepal (capital Katmandu; independent kingdom of the Gurkas); Bhutan (native state; external relations controlled by Government of India); Assam (capital Shillong; province; tea); Burma (province; capital of Upper Burma, Mandalay; capital of Lower Burma, Rangoon).

50. Draw a map of Burma. Put in the 3,000 feet contour, the Irriwadi and the Salween. Name the Arakan Yoma, and the Patkoi Mountains.

51. Give an account of the climate of Burma, using the following information: Summer—south-west monsoon; heavy rainfall (80–150 inches) in coast districts, decreasing inland; area round Mandalay has very little rain. Winter—

north-east monsoon; little rain, especially in Irriwadi valley. Tropical forests on coast and Irriwadi delta; sub-tropical forests inland.

52. Show the following in a map of Burma: Rangoon (capital of Lower Burma; port; exports rice and teak); Moulmein (port; rice and timber); Mandalay (capital of Upper Burma; silk-weaving); Bhamo (trading centre). Note the following productions: Jade in the north; petroleum in the centre; rubies north of Mandalay; teak forests along the Irriwadi; rice chiefly in the delta and coast. Show the railway from Rangoon to Mandalay and then north along the Irriwadi valley.

53. Draw a map of Ceylon and southern India. In Ceylon put in the 1,000 feet contour. Name: Manar Gulf, Palk Strait, Adam's Bridge (chain of Islands), Adam's Peak. Show the positions of the  $5^{\circ}$  and  $10^{\circ}$  parallels of latitude. Show also the position of the  $80^{\circ}$  isotherm—a large oval in the southern half of the island, touching the coast in the south and filling the middle half.

54. Show the chief products of Ceylon in a map: Tea and coffee in the hills round Kandy; rice at the northern and southern ends of the island; rubber on the lower slopes of the tea region; coco-nuts and copra along the coasts; cinnamon is grown in the tea region; graphite and sapphires in the centre.

55. Show the following towns in a map of Ceylon: Colombo (capital, good harbour; coaling station; port for ships to Australia and the East); Galle (port); Kandy (former capital); Trincomali (port and naval station). Show the railways from Galle to Colombo along the coast and inland to Kandy, and from a point midway between Colombo and Kandy to the northern end of the island. Note that the Maldive Islands are under the Ceylon Government.

56. Draw a map showing the following air route: Karachi, Allahabad, Calcutta, Rangoon, Singapore (thence to East Indies and Australia).



## VII. SOUTH AFRICA

1. Compare South African time with Greenwich time.
2. Draw a map of Africa and shade on it British South Africa.
3. Where does the tropic of Capricorn cross South Africa?
- 4<sup>a</sup>. Draw a map of South Africa. Put in the 3,000 feet contour, and shade lightly the interior plateau. Show on the map: The Zwart Berg, Quathlamba, Drakensberg; Witwatersrand; Table Mountain. The highest point in the Union of South Africa is about 10,600 feet high, in the Quathlamba.
4. Draw a diagram as follows: A steep upward slope; a level part; a steep upward slope; a level part; a steep upward slope and a wide level part at a lower level; and then similar terraces at the other side.

This gives roughly a section across South Africa. The first level part (nearest the sea) should be labelled: 'Little Karoo'; the next level part should be labelled: 'Great Karoo'. The wide level part is the interior plateau.

5. Draw a section of South Africa from the mouth of the Orange River eastward.
6. Draw a section of South Africa from Port Elizabeth northward to the Zambezi.
7. Show in a map of South Africa the Lake Ngami drainage basin in Bechuanaland. Show Lake Ngami and the swamps north of it, the Botletle and the Chobe.
8. Draw a map of South Africa showing the 3,000 feet contour and the following rivers: Orange River, Vaal, Limpopo, Komati River, Olifants River, Tugela River, Sunday River. Note that the Orange River loses more water by evaporation than it gains from tributaries in the last 800 miles of its course. The rivers descend from terrace to terrace by steep gorges. For this reason they are not useful for navigation.
9. Show the following summer isotherms in a map of South Africa:
  - i. 88°—a large north and south oval between 14° S. Lat. and

- 30° S. Lat., and between 17° E. Long. and 28° E. Long.; the oval is rather narrower in the south than in the north.
- ii. 72°—from Benguella (in Angola) in a straight line to St. Helena Bay, then eastward parallel to coast, through Durban.
  - iii. 80°—midway between 88° and 72°, leaving east coast at Delagoa Bay.
  - iv. 64°—just touches Cape Town and Cape Agulhas.
10. Show the following winter isotherms in a map of South Africa:
- i. 64°—from Benguella in a straight line roughly parallel with coast to Orange River, then in half circle to the Drakensberg, and then east through Durban.
  - ii. 56°—from mouth of Orange River in a straight line to Mossel Bay (east of Cape Agulhas).
  - iii. 72°—in a half circle east from the bend of the River Kuneni (northern boundary of South-West Africa), south of Lake Ngami, to Bulawayo (Rhodesia), then north-east.
11. Draw a diagram showing the ranges of temperature at the following places (show the places in a map and beside each draw an upright line showing the temperatures): Cape Town (69°, 55°), East London (70°, 60°), Durban (76½°, 65½°), Kimberley (76°, 50½°), Pietermaritzburg (73°, 58°), Pretoria (72°, 52°), Johannesburg (65½°, 50½°), Bloemfontein (72½°, 47½°), Basutoland (68½°, 46°), Swaziland (67½°, 55½°).
12. Explain how distance from the sea affects summer and winter temperatures. Illustrate the answer by reference to the diagram of Exercise 11.
13. Show the following summer isobars in a map of South Africa:
- i. 29.9 in.—from Walvis Bay, with a slight southward curve, to East London.
  - ii. 29.8 in.—south along the 22° meridian to 26° S. Lat., then in an eastward curve nearly to the Orange River, and then north-west through Johannesburg to the south of Lake Nyasa.
  - iii. 30.0 in.—an oval off the west coast, reaching across the Atlantic.

14. In the map of summer isobars show the following summer winds:

- i. east and south—south-east trades.
- ii. west coast—parallel with coast.
- iii. near Cape Town add south-west winds.

15. Show the following winter isobars:

- i. 30.2 in.—an oval running north-east and south-west, the ends being near Pietersburg in the north of the Transvaal, and De Aar in the Cape of Good Hope.
- ii. 30.1 in.—east and west, just south of Cape Agulhas and Port Elizabeth.
- 30.1 in.—from Walvis Bay to the southern end of Lake Nyasa, and then east.

16. In the map of winter isobars show the following winds:

- i. south-westerly winds in south.
- ii. North of 30° S., south-east trades.

17. Compare the summer maps showing isotherms and isobars. What effect on air pressure is produced by the heating of the land in summer?

Where is the high pressure area in winter?

18. Draw a map of South Africa showing the rainfall. Show the following regions:

- i. 35–50 in.—east coast strip from Port St. John north; north-east Transvaal, an oval between Pietersburg and Leydsdorp; west of Swaziland.
- ii. 25–35 in.—east of 27° E. Long. and south of 25° S. Lat.; narrow coast strip to Port Elizabeth; narrow coast strip from Cape St. Francis to Cape St. Blaize (this strip is half-way between East London and Cape Town; small region including Table Mountain and Cape Town).
- iii. 15–25 in.—region round Cape Town and coast strip to north of Port Elizabeth; continue the line north along the 26° E. meridian to 31° S. Lat., then NNE. to Kuruman and round in a north-westerly curve to the east of Palapwe; the curve then turns west with a southward bend, leaving a long tongue pointing east; at the 20° E. meridian the line turns north-west and then runs parallel with the coast. The land east of this line comes within the area.

iv. Under 5 in.—a wide strip on the west coast, doubling in width along the Orange River, narrowing suddenly south of the river and ending at  $31\frac{1}{2}^{\circ}$  S. Lat.

v. 5–15 in.—the area between iii and iv.

Shade the rainfall regions from black for the heaviest rain to white for the lowest.

North of about  $19^{\circ}$  S. Lat. the rainfall is heavier toward the middle and east.

19. Compare the rainfall map with the wind maps. Why does the rainfall decrease from east to west?

20. Draw a map of South Africa. Mark the Transvaal 'summer rains' (nearly 90 per cent. of the rain falls in summer). Shade a wide coast strip from Cape Agulhas north to the Orange River. Mark this strip 'winter rains' (60 per cent. or more of the rain in this region falls in winter).

The area between these two regions changes gradually from summer rains to winter rains.

21. Draw a vegetation map of South Africa. Shade or colour the following regions:

i. Palm belt—east coast strip from  $32^{\circ}$  S. Lat. northward; the strip is about a third of the width between the coast and Basutoland.

ii. Thorn Veld—take a line north from Cape St. Francis nearly to the  $32^{\circ}$  parallel, then north-east parallel with the coast and missing Basutoland, to  $25^{\circ}$  S. Lat., then east to the palm belt.

iii. High Veld—Transvaal south of Pretoria, with most of the land north and east of Pretoria and south of  $25^{\circ}$  S. Lat. (a triangle in the middle, tapering south, belongs to the Bush Veld); Orange Free State, except the south-west; Basutoland; Cape of Good Hope between Orange Free State and Thorn Veld.

iv. Bush Veld—Transvaal north of High Veld and east to palm belt.

v. Forests—coast strip from Cape St. Francis to Cape St. Blaize.

vi. Scrub—region round Cape Town. Draw a line along the  $32^{\circ}$  parallel to  $19^{\circ}$  E. Long., and then parallel to the coast and just along the north of the forests.

- vii. The Karoo—from the  $32^{\circ}$  parallel (actually from the mountains) south to the scrub region.
  - viii. Karoo plateau—south of  $30^{\circ}$  parallel, with a triangle north to Kimberley. Take the boundary south-west from  $20^{\circ}$  E. Long.
  - ix. Kalahari grassland—start at  $22^{\circ}$  S. Lat. and  $18^{\circ}$  E. Long., draw a line parallel with the coast to the Karoo plateau; extend the region westward just north of the plateau and indent it to the east just north of this.
  - x. Mark the region west of the Kalahari grassland—‘desert’.
22. Put the following information on the vegetation map:
- i. Palm belt—sub-tropical forests; largely cleared for sugar plantations.
  - ii. Thorn Veld—grasslands with scattered thorn bushes.
  - iii. High Veld—grasslands, great rolling tablelands without trees, except in Basutoland. Many tuberous plants with stores of food for quick growth.
  - iv. Bush Veld—park-like country, covered with trees. Many bushes and shrubs.
  - v. Forests—chiefly yellow-woods and evergreens.
  - vi. Scrub—shrubs and bushes up to six feet in height. Leaves are small and leathery.
  - vii. The Karoo—desert vegetation, many tubers and bulbs which allow rapid growth. Usually no trees. After the rains the Karoo is a blaze of colour.
  - viii. Karoo plateau or Upper Karoo—treeless plains with table-topped hills. Shrubs and small bushes.
  - ix. Kalahari grassland—grassland with scattered bush and isolated trees.
  - x. Western desert—arid plains, table mountains. River beds dry during most of year. Vegetation scanty, especially near sea.
23. Find on a map of the world:
- i. Regions in the same latitude (north or south) as Cape Town, and on the western sides of continents.  
Note these as sub-tropical regions.
  - ii. Deserts which lie along or close to the tropics.

24. On which side of continents are deserts usually found? What is the reason? The trade winds explain the reason.
25. Collect pictures of all or any of the following South African animals: Baboon (in mountains), blue monkey, lion (Bechuanaland and northern Transvaal), cheetah or hunting leopard, lynx, mongoose, hyena, aardwolf, jackal, Cape hunting dog, eland, springbok, and other deer, gnu or wildebeest, giraffe, rhinoceros, hippopotamus, wart-hog, zebra, ant-eater, armadillo.
26. Draw a diagram showing the number of horses in the Union of South Africa in the following years: 1904—450,000; 1911—720,000; 1918—780,000; 1919—695,000; 1920—690,000; 1921—920,000.
27. Draw a diagram showing the numbers of the domestic animals in the Union of South Africa: Horses—920,000; mules—120,000; asses—725,000; cattle—8,600,000; sheep—37,750,000; goats—7,830,000.
28. Write an essay on ostrich farming, using the following and any other information: Wild ostriches formerly found all over South Africa, and still in some districts. Ostrich farming began fifty years ago. Birds kept in by wire fencing, special crops grown for them. Total number of ostriches: 1904—360,000; 1911—750,000; 1921—260,000. The decrease was a result of the War.
29. Give an account of the export of chilled eggs, using the following and any other information: Eggs allowed to cool, placed at once in cold storage, chilled not frozen, voyage to England—fourteen days, sold in fresh condition.
30. Draw a map of South Africa:
- Draw a line from Mafeking to Pretoria, and continue it east to the 30° meridian; continue from Mafeking to Bloemfontein in a westward curve; then along the north-west boundary of Basutoland, and on to the 30° meridian; then north along this meridian. Shade this region, and name it: Chief maize region.
  - Continue the south-east boundary of Basutoland curving down to Port Elizabeth; draw the southern boundary of the Transvaal, east from the chief maize district. Shade lightly the region between these lines and the east coast.

Name this region: Second maize region (of lesser importance).

iii. Draw the boundary of the Transvaal. Name the part of the Transvaal north of the chief maize region: Third maize region.

31. Draw a diagram showing the increase in maize production in the following years (production is given in thousands of tons): 1910—230,000; 1913—250,000; 1916—280,000; 1919—370,000; 1920—460,000.

32. Draw a map of South Africa showing the boundaries of the provinces. Write on the provinces the chief fruits exported: Cape Province—peaches, pears, apricots, plums, oranges, naartjes (like the tangerine), pineapples, melons, grapes; Transvaal—oranges, naartjes, grape-fruit, mangoes; Natal—oranges, naartjes, pineapples, bananas, mangoes; Orange Free State—pears, peaches, apples.

33. Show the following productions on a map of South Africa: Vines (grapes, wine, brandy, raisins, currants)—Cape Province; tea—Natal; cotton—Transvaal (1), Natal (2); tobacco—Transvaal (1), Cape Province (2); cane sugar—Natal and Zululand.

34. Find which South African products are sold at the grocer's.

35. Draw a minerals map of South Africa showing: Gold—Witwatersrand (Johannesburg), Lydenburg. The yearly output of the Rand is about £40,000,000; diamonds—Kimberley (Cape), Jagersfontein (Orange Free State), Premier mine (Transvaal, 20 miles ENE. of Pretoria), newly opened up area at Port Nolloth, Namaqualand; coal—Transvaal (draw lines joining Johannesburg, Belfast, and the south-east corner; this gives the area), Natal (Vryheid, Newcastle); copper (Cape Province, Transvaal); tin (chiefly in Transvaal); asbestos (Cape, Transvaal-Lydenburg).

36. Draw a railway map showing the following railways: i. Cape Town to De Aar, Kimberley, Johannesburg, Pretoria. ii. Pretoria (round Basutoland) to Ladysmith, Pietermaritzburg, and Durban. iii. Pretoria to Bloemfontein, Naauwpoort, and Port Elizabeth, with a parallel line to East London from north of Naauwpoort. iv. Pretoria to

Komatipoort and Lourenço Marques. v. Kimberley to Mafeking, Bulawayo, and Victoria Falls, with a line from Bulawayo to Salisbury. vi. From De Aar to Seeheim (in South-West Africa), then parallel with the coast; a line running north-east from Swakopmund meets this line and continues north-east into the interior.

37. Show in a map the provinces and their capitals: Cape of Good Hope (Cape Town), Natal (Pietermaritzburg), Transvaal (Pretoria), Orange Free State (Bloemfontein). The Union Government is at Pretoria; the Union Parliament meets at Cape Town.

38. Draw a map showing the ports of South Africa: Cape Town (Table Bay Harbour, seat of Union Parliament, passenger port, chief exporting town of the Union—wool, fruit, wine; coaling station on route to India and Australia); Port Elizabeth (the third port of the Union); East London (at the mouth of Buffalo River, trades in wool); Durban (chief importing town of the Union, exports from Transvaal and Natal, exports coal); Mossel Bay; Port Nolloth; Simonstown (naval station).

39. Show the following towns in a map of South Africa: Kimberley (diamond mining); Graham's Town (health resort); Graaf Reinet; King William's Town; Pietermaritzburg (capital of Natal, picturesque city with equable climate, 2,200 feet above sea); Ladysmith; Pretoria (capital of Transvaal, seat of Union Government, new buildings have been put up to house the Government Departments); Johannesburg (largest town of the Union, nearly 300,000, centre of the Rand gold mining region); Germiston; Lydenburg; Bloemfontein (capital of Orange Free State, on a watershed with good water supply, trading centre); Harri-smith (on rail route to Natal); Jagersfontein (diamonds).

40. Draw a map illustrating the history of South Africa: Cape of Good Hope—discovered by Bartholomew Diaz, 1486; Mossel Bay and St. Helena Bay—Vasco da Gama landed, 1497; Sir Francis Drake's voyage round the Cape, from the east, 1580; Table Bay—first settlement by van Riebeck (Dutch); Battle of Blaauwberg and surrender of Cape to Sir David Baird, 1806; Cape ceded to England, 1814; the '1820 settlers' land at Port Elizabeth; Durban



founded, 1835; Natal proclaimed British, 1843; Orange Free State formed 1854; independence of Transvaal recognized, 1881; opening of Rand gold fields, Johannesburg founded, 1886; Boer War, sieges of Ladysmith and Kimberley, 1899; occupation of Bloemfontein, Johannesburg, Pretoria, 1900; Peace of Vereeniging, 1902; Union of South Africa constituted, Parliament opened at Cape Town, 1910; South-West African mandate, 1919.

41. Draw a map of South-West Africa. Draw the 3,000 feet contour. Put in the following information: Rainfall—1 inch on coast, 6 inches in south, 12 inches in centre, 22 inches in north; hot and dry; no perennial streams except Orange River in south and Kunene and Okavango in north; Walvis Bay (the best harbour); Luderitz (good harbour, port, diamond mining); Swakopmund (port transferred to Walvis Bay); put in the railways (see Exercise 36); formerly German South-West Africa, now held by the Union under a mandate; Windhoek is the capital, and a business centre; chief industry—cattle raising; water obtained by sinking wells.

42. Draw a map of South Africa showing the position of Basutoland. Show the Drakensberg Range (the highest peaks rise to 11,000 or 12,000 feet). Cultivation only possible on lower hills in west. Add the following information: Rainfall about 30 inches; population, nearly 500,000 natives and less than 2,000 Europeans; chief industries—agriculture and pasture (nearly one million goats, over half a million cattle, nearly two million sheep); land held communally and apportioned by chiefs; chief exports—maize, wheat, wool; capital—Masern (a small town).

43. Draw a map showing the boundaries of Bechuanaland. Name the Kalahari Desert, Lake Ngami, Chobe River. Note on the map: Country chiefly pastoral, cattle numerous; government—protectorate, under High Commissioner for South Africa; population over 150,000, with less than 2,000 Europeans.

44. Draw a map of Africa showing the Cape to Cairo route and the completed sections of the railway. Put in the Nile, the Zambezi, the great lakes, and indicate the chief mountains. Put in the railways from Cairo to Sennar and from

Cape Town to Kimberley, Bulawayo, Victoria Falls, and Broken Hill. Indicate a possible connexion along valleys and rivers.

45. Draw a map of Africa showing the following air route: Khartoum to Kisumu (by flying-boat), Kisumu to Johannesburg (by aeroplane).

## VIII. RHODESIA

1. Draw a map of Africa showing the position of Rhodesia. Name north-eastern Rhodesia, and north-western Rhodesia, and Southern Rhodesia. Name the port of Beira in Mozambique.

2. Draw a map of Rhodesia. Put in the Matopo Hills, the Limpopo, the Zambezi, the Loangwa, the Luapula, Lake Bangweulu, Lake Mweru. Mark the position of the Victoria Falls.

3. Draw a map of Rhodesia and put in the 3,000 feet contour. Note that Rhodesia is part of the South African plateau.

4. How does the land slope in Rhodesia? Find this by noting the slope of the rivers.

5. Over what range of latitude does Rhodesia extend?

6. Write an account of the climate of Rhodesia, using the following information: Dry season—April to September; wet season—October to March; rainfall 56 inches in east, falling toward the west and south to 26 inches; temperature moderate on account of elevation—temperate in higher parts, sub-tropical in lower. Night frosts occur in the period from May to August.

7. The following mean annual temperatures are given for Southern Rhodesia:

<i>Altitude up to 1,000 ft.</i>		<i>1,000 to 2,000 ft.</i>	<i>2,000 to 3,000 ft.</i>	<i>3,000 to 4,000 ft.</i>	<i>4,000 to 5,000 ft.</i>
Mean annual temperature	82°-76°	80°-74°	77°-70°	72°-65°	68°-63°

What is the average fall in temperature for each increase of 1,000 feet in altitude?

8. Draw a map of Rhodesia showing the chief productions: Gold—on the high veld, chiefly near railway from Salisbury

to Bulawayo, also at Umtali; coal—Zambezi basin and south-east; chrome (Selukwe); copper (Umvuma); lead (north-west Rhodesia); vanadium (north-west Rhodesia—Broken Hill); asbestos (Belinzwe); cattle, maize, tobacco, oranges (in districts where irrigation is possible in the dry winter months); ivory and rubber (Northern Rhodesia).

9. Show the following railways in a map of Rhodesia: Bulawayo to Salisbury (from Mafeking and Cape Town); Salisbury to Umtali and Beira; Bulawayo to Victoria Falls (Livingstone in Northern Rhodesia) to Kalomo, Broken Hill, and the Belgian Congo. Note that the journey from Cape Town to Bulawayo takes four days.

10. Name the following towns in a map of Rhodesia. Salisbury (capital of Southern Rhodesia, founded in 1890, beautiful gardens, agricultural and trading centre); Bulawayo (capital of Matabeleland, mining and agricultural centre, near Matopo Hills); Gwelo (oranges); Umtali (centre for tourists close to the 'Alps of Rhodesia'); Broken Hill (mining centre in Northern Rhodesia).

11. Draw a diagram illustrating the chief exports of Southern Rhodesia (values in thousands of pounds): Gold (2,208), asbestos (451), chrome (332), copper (316), tobacco (221), cattle (206), maize (130), hides (38), oranges (33).

Find the increase in the number of each part of the population, and the increase per cent. (on the 1921 numbers).

12. Write a short account of the history of Rhodesia, using the following and any other suitable information: 1888—Treaty with Lobengula (ruler of the Matabele), giving the British rights over minerals in return for payments; 1889—Charter granted to British South Africa Company; 1890—Pioneer force of police and settlers founded Salisbury (Mashonaland); 1893—Matabele invaded Mashonaland and were defeated; 1896—Matabele revolt ended after 'indaba' with Cecil Rhodes, who remedied the native grievances; 1897—railway line from Cape Town reached Bulawayo. Nearly all cattle lost by rinderpest (afterwards stamped out by inoculation of cattle); 1899–1902—development stopped by Boer War; 1923—self-government granted to Southern Rhodesia.

## IX. EAST AFRICA

1. Draw a map of Africa. Show on it the boundaries of Uganda, Kenya, and Tanganyika. Name these countries and shade them in different ways.

2. Draw a map of East Africa. Put in the 4,000 feet and 8,000 feet contours. Shade the land over 4,000 feet. This is the East African plateau. Name Kilimanjaro (19,712 ft.), Mount Kenya (17,000 ft.), Ruwenzori (16,800 ft.). Note that the snowline is at about 15,000 feet.

3. Draw a map of East Africa, and put in the 4,000 feet contour. Put in: Lakes Nyasa, Tanganyika, Edward, Albert, Victoria, Rudolf. Draw the following lines: i. Just west of Lake Albert, running south and close to Lakes Edward and Tanganyika, curving round to Lake Nyasa and then parallel to it on the west. ii. A line parallel to the last on the east side of the lakes, as far south as the northern end of Lake Nyasa, curving round and running north round the west of Lake Rudolf (keep to the east of Lake Victoria), then north-eastward. iii. A line parallel to the last, passing to the east of Lakes Rudolf and Nyasa.

Shade the narrow spaces between these lines. These are the two branches of the East African rift valley, where the plateau has sunk. The lakes are 2,000 feet lower than the plateau. Lake Victoria is in a slight depression on the plateau. (Its height is 3,700 ft.)

4. Draw a map of the East African lakes. Name the lakes and rivers connected with them. Put in the following information: Victoria—area nearly 27,000 sq. miles, 3,726 feet above the sea, source of the Nile, steamship service on the lake, Jinja is a port where the Nile leaves the lake, Kisumu is the chief port; Albert—2,000 feet above sea, steamship service to Nimule on the Nile; Rudolf—in arid region, with, however, numbers of cattle and sheep; Tanganyika—area nearly 13,000 sq. miles, over 4,000 feet deep, beautiful surroundings, after abnormal rains surplus water flows to Congo by Lukuga Valley, Kalambo Falls near east shore are 880 feet high, Belgian and British steamers; Nyasa—360 miles long and 16 to 50 miles wide, discharges by Shiré River to Zambezi, steamer service.

5. Draw a diagram showing the mean monthly rainfall at Mombasa. The rainfall in inches from January on is: 0·81, 0·75, 2·48, 8·19, 12·80, 4·23, 3·63, 2·34, 2·30, 3·27, 4·03, 1·88. What is the mean annual rainfall? Which are the wettest and driest periods?

6. Draw a similar diagram for Nairobi. The rainfall in this case in inches is: 1·40, 2·03, 6·07, 9·43, 5·59, 1·48, 0·72, 1·32, 0·66, 2·41, 4·00, 2·18.

Which period might be described as 'the long rains', and which as 'the short rains'? Which is the dry season?

7. Compare the ranges of temperature (mean summer and mean winter) at the following places: Mombasa—6·7°, Nairobi—5·7°, Kisumu—4°, Mazunga (Southern Rhodesia)—17·5°, Umtali—13·4°, Pretoria—20°, Durban—12·7°, Bloemfontein—26°, Kimberley—24·7°, Cape Town—13·4°.

Show these places in a map of East Africa and South Africa. Note the influence of distance from the sea, and of being in the equatorial zone.

8. Draw a section east and west across Kenya and Uganda. Mark the coast region 'tropical forest', and the highlands (6,000 ft. to 9,000 ft.) 'temperate forest'.

9. Draw a map of Kenya and Uganda. Put in the 1,200 feet and 3,000 feet contours; Lakes Victoria, Albert, and Rudolf; the Nile, the Tana. Name Mount Kenya, Elgon, Maroto, Ruwenzori. Name: Mombasa (note distance from equator, on an island 3 miles by 2 miles, chief port); Nairobi (capital of Kenya and Uganda, nearly 5,500 ft. above sea, cool climate); Kikuyu (mission station and centre of agricultural district); Kisumu (chief port on Lake Victoria); Kampala (commercial and government centre); Jinja (port).

Show the railway—Mombasa to Nairobi and Kisumu; show the branch to Lake Magadi (this lake is estimated to contain 200 million tons of carbonate of soda. This is an important export).

10. Draw a map of Tanganyika Territory and Nyasaland. Put in: the 3,000 feet contour; Lakes Tanganyika and Nyasa; the Lukuga, the Shiré River, the Zambezi, the Ruaha. Name: Pemba Island and Zanzibar Island (ninetenths of world's supply of cloves comes from these two

islands); Zanzibar (west of island, for centuries the largest town in East Africa, over 200,000 population, trading centre); Dar-es-Salaam (seat of government, harbour for Arab trading dhows which collect mangrove bark, copra, &c.; native town has avenues lined with coco-nut palms); Tabora (an Arab town with good water supply, where many trade routes meet).

Show the railways—Dar-es-Salaam to Tabora and Ujiji (one of the old Arab trading centres in slaves and ivory, harbour now choked owing to a fall in the level of the lake); Tanga (port) to Moshi (centre of great coffee belt, on southern slope of Kilimanjaro); a branch runs from south of Moshi, eastward to Voi on the Mombasa-Nairobi line; from Blantyre, south along the Shiré River to Beira (in Mozambique). Name: Blantyre (chief commercial centre of Nyasaland).

11. Draw a map of East Africa showing the chief productions: Zanzibar and Pemba (cloves and coco-nuts), coast regions (coco-nuts, sandal wood, rubber, mangrove bark—used for tanning), highlands (coffee, maize, cotton, sugar, tobacco, bananas). Sisal, used for rope making, is largely grown in sandy land with little water. Cattle, sheep, and goats (held chiefly by natives) do well above 5,000 feet.

12. Draw a diagram illustrating the chief exports from Kenya and Uganda (values given in thousands of pounds): Cotton (3,000), coffee (895), sisal and tow (580), maize (280), hides (270), rubber (136), sodium carbonate (very variable, 90 to 260), ivory (50).

13. Draw a diagram illustrating the advance of cotton cultivation in Uganda (values in thousands of pounds): 1914—318; 1921—1,280; 1923—2,090; 1924—3,490; 1925—4,686; 1926—3,050.

14. Draw a map showing the positions of British Somaliland and Aden. Name the Strait of Bab-el-Mandeb, the Gulf of Aden, Berbera (port of British Somaliland), Aden (coaling and military station with large water tanks—ancient tanks restored, entrepôt for goods between Europe and Asia). Note: Coast of Somaliland hot, arid, and barren; inland there is pasturage for cattle and sheep. Camels exported to Aden, also gums (frankincense and myrrh) and coffee.

15. Draw a map of the Anglo-Egyptian Sudan. Mark in it the climatic regions: i. North of Khartoum—arid, only rain cultivation close to bed of Nile. ii. Khartoum to Kodok (Fashoda)—chief rain cultivation region. iii. South of Kodok—heavy rainfall, region of sudd (swamps covered with masses of dense vegetation).

16. Draw a map of the Sudan and show in it the chief productions: i. North of Khartoum—sheep, goats, cattle, camels, close to river. ii. Rain cultivation region—cotton, gum arabic (Kordofan), dates, maize.

17. Name the following places in a map of the Sudan: Khartoum (capital, Gordon Memorial College and Lord Kitchener Memorial School of Medicine); Omdurman (great native market); El Obeid (market for gum arabic, from trees in Kordofan. Wild gum trees grow in a belt across Africa. Collectors go far into the desert after them. They depend on the wild melon for food and fodder); Sennar (a great irrigation dam was finished in 1925, above Sennar; 9,000 miles of irrigation canals are supplied from it, irrigating nearly half a million acres. This region produces good quality cotton); Kodok (Fashoda); Port Sudan (the up-to-date port of the Sudan, exports cotton and grain); Kassala (at the head of a fertile delta formed by the Gash. Below the delta the river is lost in the desert sands).

18. Show the railways in a map of Egypt and the Sudan: i. From Alexandria to Cairo, following the Nile to Wadi Halfa, straight across to Abu Hamed, following the river to Khartoum, then to Sennar and from Sennar to El Obeid. ii. From Port Sudan to just south of Berber with a branch running south to Kassala.

## X. WEST AFRICA

1. Draw a map of Africa. Show the boundaries of: Nigeria, Gold Coast, Sierra Leone, Gambia. Shade and name these countries and name the capitals.

2. Draw a map of West Africa. Draw the 1,200 feet contour, and shade land over 1,200 feet. Note the positions of two plateaux.

3. In the same map put in the chief rivers: the Niger and its navigable tributary, the Benue; the Volta, the Gambia. Put in also Lake Chad and the Yobe.
4. Write an account of the climate of West Africa, using the following information: Climate tropical; rainy season—May to October; dry season—November to April; dry season begins with the 'harmattan', a sand-laden north-east wind from the Sahara; rainy season—south-west monsoonal winds; rainfall reaches 150 inches on coast, 90 inches inland.
5. Draw a map of West Africa. Name: Cape Verde, Cape Palmas, Cape Three Points, Cape Lopez; Gulf of Guinea, Bight of Benin, Bight of Biafra; Upper Guinea, Lower Guinea.
6. Draw a map of West Africa:
- Draw a line from the mouth of the Gambia across the north of the Bight of Benin and just a little way in from the coast. Shade the land between this line and the coast; name it 'Tropical Forest'. (The tropical forest extends east to the  $30^{\circ}$  E. meridian. It covers most of the area south of the line just drawn, and north of  $8^{\circ}$  S. Lat.)
  - Draw a line just north of the Senegal, Niger, and Yobe. Name the land between this line and the tropical forest 'Savannahs and grasslands'. Name the land north of this 'Desert'. South of the great northward bend of the Niger is a patch of semi-desert.
7. Write an essay on the tropical forest, using the following and any other suitable information: In a region of great heat and heavy rain; many hardwood trees—African mahogany, ebony, odum; smaller trees below greater trees, including many palms; dense undergrowth; many creepers, some of great thickness; few flowering plants; orchids grow on trees; mangrove and coco-nut near sea; animal life suited to dense forests—apes (including the gorilla) and monkeys, snakes and other reptiles, numerous insects, some of great size.
8. Draw a map of Nigeria. Put in the Niger, with its delta, the Benue, Lake Chad, the Yobe. Write on the delta 'Mangrove swamps'. Write on the tropical forest region: Hardwoods, oil palm, coco-nut, rubber, cotton, rice. Write on



the savannah region: Dates, ground-nuts (for oil), wheat, cotton, rice (note that rice is grown in 'paddy fields' in the swamps as well as in dry uplands). Indicate by outward arrows the chief exports: Palm oil and kernels, rubber, ebony, cotton.

9. Draw a map of Nigeria and put in the rivers. Name: Lagos (capital and port); Akassa (engineering works); Ida (trading centre for palm oil); Kano (distributing and trading centre); Sokoto; Yakoba.

Put in the railway from Lagos to Kano.

10. Draw a map of the Gold Coast. Put in the River Volta. Mark the tropical forest region: Hardwoods, mangrove, coco-nut, oil palm, tropical fruits (pineapple, mango, banana, &c.). Mark the northern part—'open country', wild plum, shea-butter tree, kola-nut, cotton, and tobacco (these grow wild). Maize, millet, ground-nuts, and rice are grown in the Northern Territory. Indicate by outward arrows the chief exports: Cocoa, palm oil, kola-nuts.

11. Draw a diagram showing the development of cocoa growing on the Gold Coast: 1900—500 tons; 1907—10,000 tons; 1911—35,000 tons; 1914—54,000 tons; 1917—80,000 tons; 1919—176,000 tons; 1925—218,000 tons; 1926—230,000 tons. The Gold Coast now produces more than half the total supply. The cocoa is grown by the natives.

12. Draw a map of the Gold Coast. Name the Gold Coast Colony, Ashanti, and the Northern Territory. Name: Accra (capital and port); Sekondi (port); Takoradi (near Sekondi; a new port, and the only deep-water port on the coast); Cape Coast (port); Kumasi (chief town of Ashanti).

Put in the railway from Sekondi to the Tarkwa gold field and Kumasi.

13. Draw a map of Sierra Leone. Name: Freetown (capital, best harbour on west coast, founded for freed slaves, has the Fourah Bay College—affiliated to Durham University). Put in the railways: i. From Freetown, across the colony, with a southward curve. ii. Starting a quarter of the length from the Freetown end, and running NNE.

Show by outward arrows the chief exports: Palm oil and kernels, kola-nuts, ginger. Swamp and hill rice are grown.

14. Draw a map of Gambia and put in the river. Name Bathurst (capital and port). Note the chief productions: Ground-nuts, rubber, beeswax, rice, cotton.

## XI. DETACHED POSSESSIONS

1. Draw a map of the Mediterranean. Name in it: Gibraltar ('Key to the Mediterranean'; an immense rock 1,440 feet high; used as fortress and coaling station; town on narrow terraces, very mixed population); Malta, Gozo, and Comino (Malta the largest; area nearly 100 sq. miles; surface without soil except where soil has been imported from Sicily; hot climate; Valetta—capital, naval, and coaling station).
2. Indicate the shipping routes from England to India:
  - i. Southampton, Gibraltar, Malta, Suez.
  - ii. Southampton, Gibraltar, Marseilles (Strait of Messina), Suez.
  - iii. London, Paris, Marseilles, Suez.
3. Draw a map of the Red Sea. Show the Suez Canal, the Sudan coast and Port Sudan, Perim (in the Strait of Babel-Mandeb), British Somaliland and Berbera, Sokotra (produces aloes, gums, tobacco, dates).
4. Draw a map of the Indian Ocean and show in it the following British islands: Bahrein Islands (Gulf of Persia, transit trade, pearl fishing); Kuria Muria Islands (guano); Seychelles (group of about 90 islands; largest island—Mahé, capital Victoria, a coaling station; export copra, vanilla, guano); Mauritius (area 720 sq. miles; capital and chief port, Port Louis; chief source of cane sugar in the Empire); Rodriguez and the Chagos Archipelago (small coral islands) are under the Mauritius Government.
5. Draw a map of the Malay Peninsula and the East Indies. Name on it: The Straits Settlements; Sarawak, Brunei, British North Borneo, Labuan.
6. Draw a map of the Straits Settlements and name: Singapore (capital, population over half a million, great emporium for eastern produce); Penang and Wellesley (rice); Malacca (tapioca, rubber, copra); islands under the Singapore Government—Cocos or Keeling Islands (small coral islands, large coco-nut plantations); Christmas Island (deposits of phosphate of lime).

Show also the Federated Malay States (under British Protection; large exports of tin; rubber and coco-nut Perak and Selangor are the chief states). Johore (export rubber, pepper, coco-nuts), Kedah (rice), and other small states are not in the Federation.

7. Draw a map showing Singapore at the entrance to the Pacific. Indicate routes to Calcutta, Bombay, Bangkok, Manila, Hong-Kong, Yokohama.

8. Draw a map of Borneo. Show in it: Sarawak (ruled by Raja Brooke and his successors; gold, petroleum, pepper, sago, rubber; capital Kuching); British North Borneo (property of British North Borneo Company; jungle produce—timber, rubber, rattans, guano, edible birds'-nest, tobacco, sago, coco-nuts, coffee, pepper; capital Sandakan); Brunei (protectorate; capital Brunei); Labuan.

9. Draw a map of China showing the position of Hong-Kong (an island, area 35 sq. miles, close to coast; capital Victoria; great emporium for China trade; exports tea, silk, sugar, flax, rice, &c.).

10. Draw a map of the east coast of Australia and New Zealand. Show the position of the Fiji Islands (largest islands hilly, up to over 4,000 feet; dense forests on south-east sides; exports—sugar, copra, bananas, sea-cucumbers; capital and port, Suva; Levuka is the second town). Show also the Gilbert and Ellice Islands (phosphates and copra) Solomon Islands (copra, ivory, pearl-shell), Tonga or Friendly Islands (copra and fruit).

11. Find the position of Pitcairn Island (area 2 sq. miles, exports arrowroot and coffee).

12. Show the following islands in a map of the South Atlantic: Ascension (rocky island, little vegetation; area 35 sq. miles; small population—under 200; the port is a naval station; island noted for turtles); St. Helena (area 47 sq. miles; mild and equable climate; population nearly 4,000; port and capital, Jamestown, is a coaling station; Napoleon banished 1815–21); Tristan da Cunha (area 45 sq. miles, greatest height over 8,000 feet, population about 160); Falkland Islands (total area 6,500 sq. miles; sheep farming the chief industry; exports—whale-oil, wool,

heepskins, sealskins; capital and port—Stanley, in East Falkland); South Georgia (area 1,000 sq. miles; whaling station; population about 1,000; island snow-covered and barren; dependency of Falklands); other dependencies of the Falklands, also whaling stations, are the South Shetlands, the South Orkneys, the South Sandwich Group.

13. Draw a map showing the position of Iraq (British Mandate). Put in the Tigris, Euphrates, and Shatt-el-Arab. Name the Persian Gulf and the countries round Iraq—Turkey, Persia, Syria, Arabia.

14. Write an account of Iraq, using the following and any other suitable information: Climate hot and dry; basin of the river is a fertile tract between deserts; irrigation schemes will probably restore ancient prosperity.

15. Show the following towns in a map of Iraq: Basra (port with many canals, for Bagdad and basin of rivers; entrepôt trade between Iraq, India, Arabia, Persia, and Europe); Bagdad (capital and trading centre; manufactures silks; exports wool and gums); Mosul; Kut-el-Amara.

Put in the railways from Basra along the Euphrates to Hit; from Mosul to Bagdad and Kut. Show the caravan route from Bagdad to Hail, Jaufr, and Damascus.

16. Draw a map of the Levant showing the position of Palestine (British Mandate). Name the River Jordan, the Dead Sea, and the countries round Palestine.

17. Write an account of Palestine, using the following and any other suitable information: The maritime plain has a width of about four miles in the north, narrowing at Mount Carmel and at Jaffa; between Mount Carmel and Jaffa is the wider Plain of Savona; the coast plain is of great fertility. Inland the country is mountainous. The Plain of Esdraelon is the great highway and the battle-field of Palestine; it is very fertile. The climate is sub-tropical; rainfall about 28 inches; rainy season November to April; heavy dews in summer; eastern Palestine has an extreme range of temperatures; chief crops—vine, fig, olive, orange, millet, sesame, wheat, barley; no mines and few manufactures.

18. Draw a map of Palestine. Put in the 1,200 feet contour; the River Jordan, Waters of Merom, Sea of Galilee, Dead

Sea (1,291 feet below sea-level; extremely salt; no fish or vegetable life; extreme climate). Name the Mountains of Judah, Hills of Ephraim, Mount Carmel.

19. Show the following towns in a map of Palestine: Jerusalem (capital; the ancient city of David; manufactures pottery); Jaffa (port; exports oranges); Gaza (port; exports barley); Haifa (port); Akka (Acre; port); Bethlehem (birthplace of Christ); Nazareth.

Put in the following railways: From Cairo and El Arish to Gaza, Lud, Samaria, Haifa, and Akka (note how this line follows the coast plain); Lud to Jaffa; Lud to Jerusalem; from south of Gaza to Beersheba.



